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since the issuance of Vol. XXXII, No. 1, February 1962.

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This issue of the REVIEW was prepared by the
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SAMUEL T. MAYO, *Chairman*, Loyola University, Chicago, Illinois
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ROBERT D. NORTH, Educational Records Bureau, New York, New York

with the assistance of

HAROLD F. BLIGH, Harcourt, Brace and World, New York, New York
EUGENE L. GAIER, State University of New York at Buffalo, Buffalo, New York
MARVIN D. GLOCK, Cornell University, Ithaca, New York
PHILIP R. MERRIFIELD, Kent State University, Kent, Ohio
WILLIAM F. WHITE, University of Georgia, Athens, Georgia

FOREWORD

In view of the current "knowledge explosion" accompanying the "population explosion," this cycle of the REVIEW finds a geometrically increased body of literature extant. The editorial policy has had to shift in certain directions: (a) increased selectivity in the choice of references for citation, with no attempt at general exhaustive bibliographies, but with priority for data-based or theoretically oriented papers rather than for descriptive, nonresearch articles; (b) reliance almost exclusively on research articles from well-known journals and readily available books; and (c) allowance for a higher proportion of evaluative and critical comment for fewer references considered to be highly important, while pointing out important trends, theoretical implications, strengths, and weaknesses.

Previous issues of the REVIEW concerned with educational and psychological testing appeared in February 1956, 1959, and 1962. These sources were consulted for their general organizational patterns as a guide in planning the present issue. The period reviewed covered July 1, 1961, through June 30, 1964; Chapter V included some earlier references.

Structured tests and projective techniques for personality assessment, which were formerly treated in separate chapters, were combined into a single chapter. Vocational interest measurement, formerly a topic in the chapter on structured personality tests, was thought to merit a full chapter. In the planning stage, it had been hoped to devote an entire chapter to new technology with regard to (a) testing in conjunction with programed instruction; (b) improved test-scoring systems; (c) improved data-processing systems; and (d) automated test administration systems. Although desirable, such a chapter was found to be infeasible. However, some of the above topics are treated within this issue.

The Chairman gratefully acknowledges contributions by the Committee members, chapter authors, and his own office staff for valuable assistance beyond the call of duty.

SAMUEL T. MAYO, *Chairman*
Committee on Educational and
Psychological Testing

CHAPTER I

General Overview of Trends in Testing

HENRY MOUGHAMIAN

Even though educational and psychological testing has not experienced any marked changes during the past three years, the period was one of constant appraisal and evaluation. The number of tests given annually in the United States continues to increase; there are no indications that this trend will subside in the near future. From the results of these tests, inferences concerning human abilities are drawn. Although this review period was not a revolutionary one, many worthwhile contributions were made. The primary tasks of the writer of this chapter are twofold: (a) to cite those contributions that will enhance the likelihood of the attainment of the multiple objectives of testing and (b) to suggest contributions that will make testing less vulnerable to criticism. This chapter also treats those developments that have important implications for teachers. Reference to previous issues of the REVIEW, particularly those devoted to educational and psychological testing, will give the reader a basis upon which to evaluate the developments to be mentioned in this discussion.

Sources of Information

Tests and Testing

One of the outstanding recent contributions in the testing field was Buros' (1961) *Tests in Print.* In addition to serving as a classified index and supplement to all previous volumes of *The Mental Measurements Yearbook*, it presents a comprehensive bibliography of tests available in English-speaking countries. Of the 2,126 tests listed in the section called "In Print Tests," 487 are not cited in any of the other books in this series. Also included are the contents of two manuals for improving tests and test manuals: (a) *Technical Recommendations for Psychological Tests and Diagnostic Techniques,* which was prepared by a joint committee of the American Psychological Association, the American Educational Research Association, and the National Council on Measurements Used in Education, and (b) *Technical Recommendations for Achievement Tests,* which was developed by a joint committee of the American Educational Research Association and the National Council on Measurements Used in Education.

Among the most notable texts that appeared during the past three years were *Measurement and Evaluation in Education, Psychology, and Guid-*

ance by Adams and Torgerson (1964), *Essentials of Measurement for Teachers* by Durost and Prescott (1962), *Principles of Psychological Measurement* by Helmstadter (1964), and *Educational Measurement and Evaluation* by Nunnally (1964). The text by Adams and Torgerson is an excellent source for graduate students. *Readings in Psychological Tests and Measurements*, edited by Barnette (1964), should provide helpful supplementary readings for a course in measurement and evaluation.

Recent revisions of noteworthy texts included *Psychological Testing* by Anastasi (1961), *Theory and Practice of Psychological Testing* by Freeman (1962), *Evaluating Pupil Growth* by Ahmann and Glock (1963), and *Measurement in Today's Schools* by Stanley (1964).

Testing Programs

Many worthwhile books dealing with the use of various scales and measures in testing programs were published. Goldman's (1961) *Using Tests in Counseling*, Bauernfeind's (1963) *Building a School Testing Program*, and Berdie and others' (1963) *Testing in Guidance and Counseling* were among the most noteworthy.

Another significant contribution to the area of testing programs was the Sixty-Second Yearbook of the National Society for the Study of Education (Findley, 1963c), entitled *The Impact and Improvement of School Testing Programs*. The contributors dealt with test theory and practice in today's schools. Several writers included critical evaluations of current issues and problems of testing. Recommendations were furnished which should be useful to those interested in testing, especially teachers.

In this same yearbook, Findley (1963a) presented an excellent treatment of the purposes and development of school testing programs, and Traxler and North (1963) gave suggestions concerning the selection and use of tests in school testing programs. If the recommendations set forth by these experts were applied to even a modest degree, testing programs and research efforts would definitely be improved.

In the first of a series of volumes, Albright, Glennon, and Smith (1963) presented a pragmatic account of the use of tests by industry. Although not so comprehensive as other sources in this area, their volume offers valuable techniques that should be of interest to those in industry. It should also eliminate some of the myths concerning the use of tests in industry.

Criticisms

Tests and testing have been focal points of criticism for many years. Much of the criticism has been unwarranted; some has been justified. Among popular critics were Black (1963), whose criticisms ranged from the test publishers to those responsible for interpreting test results, and

Hoffman (1962), who limited himself to criticism of multiple-choice items and of one of the leading test-making organizations. Gross (1962) restricted his attacks to psychological testing in industry. The American Association of School Administrators, Council of Chief State School Officers, and National Association of Secondary-School Principals, Joint Committee on Testing (1962) expressed their concern for the ramifications of external testing programs in *Testing, Testing, Testing.* In the first of a series of reports on the social consequences of ability testing, Goslin (1963) described the current status of testing in the United States in education, business and industry, government, and the military services. Possible social consequences were discussed. One common element in most of the criticisms of testing has been the contention that far too many of the persons who give tests lack the ability to interpret test data.

In *Testing Under Fire,* Noll (1964) presented an extensive evaluation of criticisms by Black (1963) and Hoffmann (1962). Noll's reply, which included references to *Testing: Its Place in Education Today* by Chauncey and Dobbin (1963) as well as to present movements and trends in testing initiated by various professional organizations, constituted one of the most thorough treatments available for those concerned with answering criticisms about modern testing practices. An editorial in *Science* (1963) offered a convincing reply to those criticizing tests. Chauncey and Dobbin presented a notable discussion of the value of multiple-choice items as well as a vigorous defense of testing.

At annual meetings of the National Council on Measurement in Education, Dressel (1962), Findley (1963b), and Trump (1963) not only gave worthwhile perspectives of the present status of testing but also suggested steps that should be taken if testing is to continue to make noteworthy progress. At the 1963 Invitational Conference on Testing Problems, Ebel (1964) listed steps to prevent further misconceptions of testing and to alleviate possible adverse social consequences of testing.

Both professional and lay critics cited the inadequate preparation of teachers in tests and measurements. Bowman (1961), Noll (1961), and Rosner (1961) expressed the need for increased teacher competency in this area. Recognizing the importance of this problem, a committee of the National Council on Measurement in Education (1962) prepared a test of teacher competence in educational measurement. Continuing the work initiated by the Council, Mayo (1964) summarized the responses of experts to a check list containing 70 statements concerning competences that prospective teachers in measurement should possess. The results of the research should have important implications for teacher training.

Developments

Although the use of tests with televised instruction is not new, this review period witnessed a trend toward the increased use of tests with programed materials. Erickson (1962) described the functions of examinations in the measurement of outcomes of televised instruction in the Chicago City Junior College. A more recent development of this program has been the increased use of programed evaluation in televised courses, one example of which was a study guide prepared by Engelhart (1963). Heath (1962) identified the functions of measurement associated with programed instruction as (a) evaluation of student achievement, (b) evaluation of the program, (c) use in program development, and (d) diagnosis and guidance. He discussed several possible effects of programed learning on achievement test construction.

In recent years, high-speed scoring services for large-scale testing programs have become available at the Psychological Corporation; Science Research Associates; Educational Testing Service; Harcourt, Brace and World; California Test Bureau; and Houghton Mifflin Company. More recently, high-speed electronic scoring machines have been made available to institutions of higher learning and to city school systems. The use of computers in test scoring and analysis has also grown rapidly. In addition to describing the ramifications of a computer-based information system on test scoring and analysis, Anderson (1962) discussed the facilitation of the work inherent in establishing norms and in producing item analyses. Stafford and Bianchini (1963) reported a program at San Jose State College that involved the use of the IBM 1620 in scoring teacher-made tests. These developments seem to represent a trend toward wide use of automated scoring devices in conjunction with computers. The extent to which this trend will become general is likely to be somewhat limited by economic factors, since present costs are high.

Large-Scale Programs

In the first of two reports since 1961 on the results of Project Talent, Flanagan and others (1962) studied various American senior high schools. They reported their findings on the diversified uses of tests by schools, the types of instruments employed, the modes of reporting test results to parents, the purposes for which tests are administered, and the trends noted in test utilization. In studying the American high school student, Flanagan and others (1964) described what the tests in the Project Talent battery measure and reported on what test data reveal concerning the achievement of American high school students. Norms were presented for 80 variables, and consequences of the test results were discussed. In these studies, tests were employed extensively in the evaluation of characteristics of the American high school and the American high school student. The comprehensive findings should be extremely influential in the realization of improvements in the guidance and evaluation functions of American high schools.

Stalnaker (1961) described the research conducted in conjunction with the National Merit Scholarship program. Holland and Astin (1962) studied the achievements (academic, artistic, scientific, and social) of college undergraduates in relation to attributes manifested in high school. Their findings were in general agreement with most previous research in the same area.

In another large-scale testing study in which more than 1,000 college students were involved, Lehmann (1963) found changes in students' critical thinking ability, attitudes, and values from their freshman to senior years. The greatest changes, which occurred during the freshman and sophomore years, were attributed by the students mostly to informal, nonacademic experiences rather than to the formal, academic course work. He implied that identifying those experiences which contribute toward these changes, whether academic or nonacademic, is one of the major problems of colleges and universities.

Construction

The construction of tests to measure the attainment of intellectual skills has been a greater problem than the development of tests to measure knowledge. Yet, even though a major aspect of the problem has been one of defining various intellectual processes, there is no doubt that tests can and do measure such processes. One of the difficulties has been that of shifting the emphasis from the measurement of mere knowledge of facts to the measurement of intellectual skills, especially in teacher-made tests.

The measurement of such objectives as values, attitudes, and appreciations has presented an obstacle to individuals in test construction for many years. Whether in a planned and systematic or an unplanned and haphazard manner, attitudes, values, and beliefs have been taught and evaluated. In a volume concerned with the development of a taxonomy of educational objectives in the affective domain, Krathwohl, Bloom, and Masia (1964) contributed a noteworthy structure for classificatory purposes. The authors provided a schema which should be valuable to teachers in classifying objectives and in writing test items in the affective domain. As the authors pointed out, problems in the affective domain remain with respect to terminology and overlap in categories. Nevertheless, it is this writer's opinion that their taxonomy can and will initiate marked progress in the measurement of traits in the affective domain.

Engelhart and Beck (1963) evaluated the improvement of tests over the years and gave practical recommendations on how to construct better tests. This section will be extremely helpful to teachers in preparing their own tests, in selecting standardized tests, and in interpreting normative data. Green's (1963) short volume should also be of considerable aid to teachers in the construction of their own examinations.

Ebel (1962) described the development of specifications for educational tests which would contribute to the design of balanced and parallel forms of an examination. Ebel's suggestions for test construction, along with those previously mentioned, will aid in overcoming what he termed three of the important problems in preparing an educational test: (a) realization of a representative sampling of content areas covered by the test, (b) production of parallel alternate forms, and (c) meaningful description of the tasks included in the test. From his experience with instructional technology, Glaser (1963) generalized the need for establishing levels of competence and performance in the development of achievement tests relating to learning outcomes. The need for the construction of test items that would maximize group distinctions was also suggested.

Administration

The importance of following prescribed directions in administering standardized tests is well known. In the instance of teacher-made tests, the relative effect upon test performance of various factors involved in test administration is not quite so evident as it is for standardized tests. Michael and others (1963) investigated the effects of three types of directions and four types of scoring formulas upon the performance of examinees. They found that higher scores resulted when guessing was encouraged and that scores decreased when guessing was discouraged. These results have implications for norms of standardized tests, depending on what the directions are relative to guessing. Since students differ in experience, scores may reflect a degree of sophistication in test-taking behavior rather than genuine differences in achievement.

For students responding to items of a vocabulary test, Boag and Neild (1962) studied the effect upon performance of time limits conducive to speediness and of an unlimited time interval. They found that some students changed their relative class standings when they were given additional time. Unlimited time benefited to the largest degree the average student who worked slowly and accurately.

Winiewicz (1963) listed desirable effects of using porta-punch answer cards instead of marked sense answer sheets in achievement testing. The advantages mentioned for the entire testing program are worthy of consideration.

In an excellent account of the Los Angeles schools program to aid teachers in proper test administration in the elementary school, Bowman (1962) described work leading to the development of two phonograph records that were used to assure uniformity in the presentation of instructions for two group standardized tests.

Interpretation of Scores

As mentioned previously, there have been numerous criticisms regarding the ability of teachers to interpret test data accurately. If these wellfounded criticisms are to be dispelled and if continued progress is to be made in testing, it is essential that marked improvement be realized in the interpretation of test scores.

In *Test Scores and What They Mean*, Lyman (1963) presented a text that should be of value to those who are not well versed in the statistics involved in measurement. The text emphasizes the various types of scores and their interrelations more than do most texts in educational measurement. Ohlsen (1963) furnished an extensive and excellent account of the interpretation of test scores. His recommendations are important aids in effective test utilization.

Engelhart's (1962) discussion of advantages of stanines over other converted score measurements of ability and achievement should be quite helpful to teachers and counselors. Demsey (1962) described the use of stanines in reporting test results to parents. The increasing use of stanines seems to favor the trend toward coarser units of measurement, which are less susceptible to misunderstanding.

Measurement Theory

Measurement of Change

The measurement of change presents a problem that is of primary significance to education. Without a reliable estimate of the degree of change characterizing a student's or a group's performance, valid appraisals of methods of instruction, of materials used in instruction, and of other variables influencing achievement cannot be made. *Problems in Measuring Change*, edited by Harris (1963), includes discussions by several psychometricians of the major problems involved in the assessment of change. For example, Bereiter (1963) presented possible solutions and implications for further research in his discussion of three basic dilemmas in measurement of change. His chapter provides an essential orientation to the interpretation of measurement of change. In another chapter, Lord (1963) discussed two major sources of confusion in measurement of change: regression effect and errors of measurement. Factors to be considered in evaluating observed changes are cited, and models are suggested for various experimental conditions which would bring observed measurements more into line with true measurements.

Additional Reference: Harris (1962).

Validity

This review period saw a continued appraisal of the concept of validity. Michael (1961) presented a thorough discussion of construct validity, of its relationship to content validity, and of its implications for achievement tests. Engelhart (1961) discussed operational definitions of instructional objectives in relation to validity. Findley (1961) related the use and interpretation of achievement tests to validity. The three preceding papers furnish an excellent framework from which teachers can obtain information useful in selecting or preparing achievement tests.

Ebel (1961) stimulated some controversy by questioning the concept of validity. At the 1963 Invitational Conference on Testing Problems, Anastasi (1964) presented an evaluation of construct validity, decision theory, moderator variables, synthetic validity, and response styles in the measurement of test validity and in its interpretation. Since use of these terms is associated with relatively recent developments in measurement, Anastasi reserved judgment concerning their future relationship to thinking about test validity. Tucker (1962) concluded that content validity is contingent upon value judgments of persons defining validity. The preceding presentations, which indicate a continued concern with basic problems of validity, should give direction to future research efforts.

Additional Reference: Engelhart (1964).

Academic Criteria and Grading

For many years, the problem of approach in college prediction has been a challenging one. Bloom and Peters (1961) provided some valuable insights. Using an internal method of scaling grades for 23 secondary schools, they found that a median within-school correlation coefficient increased from 0.54 (for unscaled school and college grades) to 0.77 (for scaled school and college grades). They also presented implications for educational practice, test development, and educational research. Employing a sample of 608 schools, a more diverse population than the one studied by Bloom and Peters, Lindquist (1963) also used internal scaling, but found only a very slight increase in median coefficient of correlation, from 0.621 to 0.629. Possibly the difference between these studies can be explained in terms of the characteristics of the schools and colleges used in the samples. Even though these studies do not constitute a formal breakthrough in the area, they probably do furnish an improved estimate of the upper limit of predictive validity that may be obtained through use of internal scaling.

Additional References: Angoff (1963); Williams and Johnston (1963); Willingham (1963).

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CHAPTER II

Trends in the Measurement of General Mental Ability

JASON MILLMAN and MARVIN D. GLOCK

The emphasis during the last several years has been on the nature and determinants of intelligence rather than on the development of new measures of general mental ability. In an excellent book in which he leaned heavily on the work of Piaget, Hebb, Harlow, and others, Hunt (1961) synthesized several streams of theoretical formulations. After attacking the notions of fixed intelligence and predetermined development, Hunt presented a concept of intelligence "based on a hierarchical organization of symbolic representations and information-processing strategies deriving to a considerable degree from past experience" (p. 109). These representations and strategies change as the organism continuously interacts with its environment. The focus in this chapter will be upon some of the persistent issues in the measurement of general mental ability in light of the emerging concepts of intelligence.

Heredity and Environment

Cattell (1963a) improved his multiple abstract analysis-of-variance model in an attempt to take into account interaction and correlation between the environment and heredity. In spite of Cattell's claim that "the relative importance of environmental and hereditary influences has become once more a controversial topic in psychology" (p. 191), most writers agreed with Anastasi (1958) that the more important question is *how* heredity and environment produce their effect. Both Hayes (1962) and Hunt (1961) pointed out that questions about the proportion of variance attributable to heredity or environment are meaningless unless the population is specified. Furthermore, as scientists learn how better to manipulate the environment to maximize intellectual growth, the relative importance of the environment will increase (Hunt, 1961).

Anastasi (1958) differentiated between two classes of environmental influences, those producing organic effects and those serving as direct stimuli for psychological reactions. This distinction appears to be identical to the nutritive and educative effects proposed by Clarke (1962) in his extension of Hebb's (1958) concept of intelligence.

In discussing the relation between heredity and environment, Hayes (1962) argued that the inherited part of intelligence consists not of abilities but of experience-producing drives (EPD's), which are tendencies to engage in activities conducive to learning. These learnings represent the measured aspect of intelligence. According to Hayes, prediction of later intelligence, especially in a young child, might be facilitated by assessment of EPD's.

Additional References: Honzik (1963); Kidd (1962).

Constancy of the IQ

Long-term reliability of intelligence test scores continued to be reported in the literature (Bradway and Thompson, 1962; Escalona and Moriarty, 1961; Pinneau, 1961). Bradway and Thompson presented data which showed that vocabulary and abstract thinking abilities continue to increase into adulthood—an observation that supports Cattell's (1963b) hypothesis that crystallized intelligence can reach its maximum long after biological maturity.

When intelligence is seen as capable of modification by the environment, nonconstancy of the IQ is considered "the most pervasive finding" (Wallach, 1963), and any long-term stability of the IQ is accounted for by a constant environment and by Anderson's (1939) overlap hypothesis. The overlap hypothesis suggests the constancy in a child's IQ is dependent on the retention of the skills and knowledge that were the basis of early scores, rather than on the relation between these early scores and gains.

A major work related to the stability of measured intelligence was contributed by Bloom (1964). Bloom pointed out that by the overlap hypothesis the correlation between intelligence scores at two different times is a function of the percentage of development at the later time which had been attained at the earlier time. He calculated that, from conception to age four, the individual develops 50 percent of his mature (age 17) intelligence; from years 4 to 8, 30 percent; and from ages 8 to 17, the remaining 20 percent.

Like Hunt (1961) and others, Bloom treated intelligence as a developmental concept that is modified as the individual interacts with his environment. The effect of the environment was seen as being greater in the earlier, more rapid period of development. The implications suggest research efforts in which improved utilization of information about the early environment may be made. Even though it may be difficult, if not impossible, to effect major changes in intelligence after it attains a high level of stability, research is also needed to find ways through which the individual may be enabled to utilize his characteristics in increasingly effective ways.

Additional References: Colver and Spielberger (1961); Levinson (1961); Pringle and Pickup (1963).

Nonintellectual Factors

The point of view that sees intellectual development as determined by how the individual interacts with his environment suggests the increased importance of research in which so-called nonintellectual factors are related to performance on intellectual tasks. There is a need to study the situational conditions which serve to facilitate or to hinder the acquisition and expression of intellectual skills.

Wrightsman (1962) reported that anxious subjects did score significantly lower than did nonanxious subjects on measures of intelligence. Subjects high in achievement motivation did equally well on tests under the conditions in which they had been told that the test was important or unimportant. On the other hand, subjects low in achievement motivation performed less well when they thought that the test was important than when they believed that the test was not important. Triple interactions between anxiety, achievement motivation, and task importance on test performance were not reported.

Van Buskirk (1961) noted an absence of a linear relationship between degree of anxiety and degree of failure on increasingly more difficult tasks. The highly anxious subjects had a strong drive to achieve until the task presented an ego threat. These findings were at variance with past results which suggested an inverse relation between degree of anxiety and quality of performance in complex learning situations.

Katz (1964) quoted a study of his which indicated that, especially with difficult intellectually oriented tasks, Negro students perform less well with white than with Negro administrators. Katz referred to another study of his which revealed that when there was some incentive to succeed, Negro students performed better on intellectual tasks in which they were to be compared to a Negro sample than on those tasks in which they were to be compared to a national sample.

Neither this section nor this chapter has been concerned with research on the effect of intellectual factors in the environment on the growth of intelligence. The study of how one can best manipulate the intellectual indicative of their general psychological unimportance (Humphreys, 1962). aspects of the environment to help children develop their mental abilities—to unlock their capacities—is a challenge for the future (Bruner, 1964).

Additional References: Cattell and Scheier (1961); Guertin and others (1962); Silverstein (1961).

Factor Analyses of Intellectual Abilities

Guilford's (1959) model of the structure of intellect continues to receive wide attention among psychological and educational workers. Humphreys (1962) offered a hierarchical organization of abilities in the Vernon-Thomson tradition. Such an organization seems to be in concert with the recent developmental concepts of intelligence. Cattell (1963b) continued to explore his notions of fluid and crystallized intelligence which were derived from factor analytic models.

Guilford's (1956) hopes of almost a decade ago that intelligence tests would be named according to their factor composition and that tests of general intelligence would include more emphasis on productive thinking seem not to be realized. The low coefficients of correlation among Guilford's tests (Guilford, 1964) suggest that they are measuring highly specific abilities. Their low generality in the test battery is most likely indicative of their general psychological unimportance (Humphreys, 1962). The usefulness of factorially pure tests to predict complex criteria has not yet been demonstrated.

Perhaps consonant with a developmental concept of intelligence is the apparent renewed interest in the factor analysis of tests of ability for different groups (e.g., Eysenck and White, 1964; Green and Berkowitz, 1964; Mukherjee, 1962; Taylor, 1964). In Tucker's (1963) model for the factor analysis of three-way matrices are possibilities for the analysis of relations between ability measures recorded for the same people on several occasions.

Although some factor analysts write as if they believe that factors are mental phenomena, factors are not entities of the mind. Factors serve primarily as categories for classifying existing tests of ability. Thus, models of intelligence based on factor analysis will be of limited usefulness in the description of the intellectual organization which is now emerging in research concerning the nature of intellectual activities until tests based on these new intellectual processes are developed.

New Approaches and Tests

One of the intriguing aspects of the work of Piaget—clarified and summarized by Flavell (1963)—is Piaget's belief in a fixed order in which successive structures of behavior and thought become manifest. This ordered schema suggests a possible ordinal scale of intelligence in which rate of development can be measured by the time elapsing between what Hunt (1961) called the "landmarks of transition" in development.

In connection with research on children's thinking, several tests have been devised to measure some of these structures of behavior and thought. For example, Smedslund (1964) constructed test items which were intended to measure the acquisition of concrete reasoning in children. One of the more ambitious attempts to construct a scale better adapted to the developmental concept of the nature of intelligence was that of Laurendeau and Pinard (1962). The scale, which is a standardized test of the child's conception of reality and causality, contains a highly structured interrogation format.

For some investigators (e.g., Wallach, 1963), the boundary between thinking and learning is an arbitrary one. Carroll (1963) defined the aptitude for a task as the time it takes one to learn the task. Sorenson (1963) employed this learning rate concept and suggested advantages of using the amount of time spent in doing programed materials as a measure of intelligence. In accord with the emphasis on potential for learning, several writers (e.g., Campbell, 1963; Vygotski, 1963) suggested the advantage of training students in the rules necessary to solve intellectual tasks as a basis for the determination of an improved measure of educability.

Agreement has not yet been reached on the appropriate role of culturally biased material in tests of general mental ability. The belief that current group tests of intelligence are biased against the culturally deprived was in large part responsible for the 1964 decision to ban group intelligence tests in New York City schools (New York City Public Schools, 1964). The recommendation for greater use of culture-fair tests (e.g., Cattell, 1963b; Riessman, 1962) needs to be considered in view of the likelihood that these tests in comparison with tests reflecting experiences within the culture will predict less well those behaviors dependent upon cultural differences. Furthermore, one can argue that since the growth of intelligence does not occur in a vacuum but is nourished by the cultural milieu, the impact of the culture on tests should not be ignored.

The trend toward abbreviated and less complex achievement-oriented traditional tests of general mental ability continued. Thompson and Finley (1963) selected the subtests from the *Wechsler Intelligence Scale for Children* which would best predict full-scale IQ. For a sample of 151 gifted elementary school children, the scores on their short form correlated 0.84 with the actual IQ scores based on the full scale. The predicted score varied only four IQ points from the actual score in 74 percent of the cases and within eight points in all but 2 percent of the cases. Positive findings resulted from using the same procedure with educable mentally retarded pupils (Thompson and Finley, 1962).

Yates (1961) performed an item analysis of the *Progressive Matrices* with homogeneous groups of highly intelligent university students. His findings prompted him to recommend that some of the items be dropped so that the instrument would become a power test rather than one measuring a combination of speed and power. Through employing selected items, Wolfson and Bachelis (1960) found that the reliability and usefulness of the original verbal scale of the *Wechsler Adult Intelligence Scale* could be maintained for 100 patients ranging in age from 16 to 72.

Other investigators found substantial relationships between scores on short vocabulary tests and scores on the more general measures of intelligence (Ammons and Ammons, 1962b; Miner, 1961). The *Quick Test* developed by Ammons and Ammons (1962a) has three forms, each containing 50 vocabulary words and one set of four pictures. Correct solution of an item consists of matching a word with the picture depicting its meaning. Mental age norms are available for chronological ages 2-18. Ratio IQ's were suggested. IQ and percentile norms were published for adults.

A number of new tests were developed in foreign countries. Joshi (1963) constructed a verbal group test of mental ability in the Hindi language. All subjects exhibited high loadings in what was interpreted as a general (*g*) factor. The first foreign-language version of the *Scholastic Aptitude Test* (*SAT*) of the College Entrance Examination Board has been completed in Spanish (Dieppa, 1964). "Equivalents" for the American *SAT* are not yet available.

In the area of the handicapped, Jones (1960) developed a tactual intelligence scale for the adult blind.

Harris (1963) revised the scoring system of the Goodenough *Draw-a-Man* test in the hope of extending the Goodenough scale to include the adolescent years. He also developed an alternate form in the figure of a woman. Kennedy and Lindner (1964) provided norms for Negro subjects on the *Draw-a-Man* test.

Additional References: Duncanson (1964); Lucier and Farley (1961).

Conclusion

In this chapter, emphasis has been placed on an emerging concept of intelligence. In this concept, the structures of general mental ability, which are partly developmental, are characterized by general strategies for processing information. The environment of the young child, especially his educational experience, is seen as playing a key role in the development of intelligence. Intelligence tests should serve to *direct* the efforts of those who can control the environment as well as to *predict* future intellectual development (Ebel, 1964). A convergence of the measurement of general mental ability and learning, with emphasis on rate of learning rather than on asymptotic behavior, is seen to be a likely trend.

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CHAPTER III

Trends in the Measurement of Special Abilities

PHILIP R. MERRIFIELD*

In a time when some proclaim the specialist and others seek a current edition of the Renaissance man, the objectives of those individuals working in the area of ability measurement are challenged. It is not enough to say *what* and *how* in assigning a labeled number to a person; one must be able to determine *what kind* of a number, *why* it is desired, and *when* it should be employed. The scope of this chapter is restricted: The reader will find sparse mention of general intelligence per se; nor will he find notations regarding either motor skills or nonaptitude traits of personality. Rather, his attention will be directed toward markers on the following course: (a) theoretical issues that concern measurement workers, (b) the evidence from validation studies involving special abilities, and (c) new tests waiting to be used.

Theoretical Concerns

In a recent article, Cattell (1964) raised a host of problems concerning validity and reliability. This never long quiescent area of discourse can but benefit from his insight into kinds of validity and kinds of reliability. From his well-known formulation leading to several kinds of factor analysis, he stipulated the following validities, in the description of which the terms relate to degree of abstraction and to immediacy of observation to psychological trait: (a) concrete-direct, (b) concrete-circumstantial, (c) conceptual-direct, and (d) conceptual-circumstantial. Instead of reliability, he would consider consistency, in terms of reliability, homogeneity, and transferability. Further, he mentioned that in many cases homogeneity should not be maximized, but rather optimized, in order to obtain an improved combination of validity and reliability in factor scales. Unfortunately, that argument is imbedded in Cattell's preference for oblique factors and multitrait descriptions of factors. It seems to the reviewer that, given a very large number of descriptive variables, it is not much of a trick to specify one combination of them rather precisely; instead, the trick seems to be to identify a trait with as little overlap of descriptive variables as is logically possible and to hope that the data support the differentiation. It may be that homogeneity and validity can be jointly maximized to higher values with orthogonal than with oblique representations of traits. However, an evaluation of the relative merits of oblique and orthogonal approaches is too complex an undertaking for this brief article.

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In a salutary plea for awareness, Fiske and Butler (1963) directed the attention of their readers to the effect of experimental conditions on responses when an experimenter is obtaining measures of individual differences. They noted how the attitudes of the examiner for aptitudes—helpful, supportive—differ from the attitudes of the examiner for personality—noncommittal, cold, perhaps even a little disdainful. That the responses in the two situations differ, at least in affect, is no surprise. Makers of tests, especially measures of aptitude, should heed the dangers of telling the examinee too little. Along the same line, Gerlach and others (1964) demonstrated that orienting examinees to do original work or to give remote associations produced almost the same level of response, relative to control groups, as had been induced by other experimenters through the use of brainstorming training. Finally, in an intriguing study, French (1963) reported differences in the factor content of relatively well-established tests of ability between a group using a *systematic* problem-solving approach and a group using a *scanning* approach to the test items.

In a fundamental paper, Keats and Lord (1962) discussed the distribution of true scores from mental tests and demonstrated through goodness-of-fit to actual distributions that the most plausible distribution is the negative-hypergeometric function. As the shape of this distribution, like the more familiar binomial, can be changed by assigning a new value to a parameter—unlike the normal distribution, which always remains bell-shaped—the following question may be raised: What is the appropriate shape of distributions of measures of special abilities? It may well be that, in populations of interest to psychologists, the true measures of some abilities are skewed. Perhaps the observed distributions of IQ measures and of other broad-gauge measures of mind are normal by courtesy of the central-limit theorem, not by reason of what may be called a rule of Quetelet.

Two recent papers by Guilford (1964a, b) represented noteworthy advances in the study of special aptitudes. In his chapter on creativity, Guilford (1964a) included references to his new theory of learning as informational transfer; this theory seems to the reviewer to have something in common with Brentano's act-psychology, while at the same time it incorporates the heretofore disparate explanations of the stimulus-response (S-R) and the Gestalt schools. Lest the reader assume that such a theory would have to be vague, let him be assured that such is not the case. The structure-of-intellect formulations are not only relatively precise but also supportive of the deduction of testable hypotheses regarding the nature of thought. For his article on zero correlations, Guilford (1964b) examined the frequencies of values of correlations from 13 studies in his series of factor analytic investigations of aptitude. He found that nearly 20 percent of the coefficients were close enough to zero that, if optimally placed, they would support the orthogonal representation of some 15 factors per study, the number typically obtained.

Additional Reference: Milholland (1964).

Validation Studies

This section is divided into factorial validity and predictive validity. First, several studies will be reviewed that deal with the establishment of factors either in samples of individuals or in collections of tests. These samples and collections differ from those which supported the initial determination of the factors. In the second section, there will be a discussion of the findings of researchers who attempted to predict useful criteria from measures of special abilities.

Factorial Validities

Christensen and Guilford (1963) explored the area of verbal fluency and tested the hypothesis that kinds of fluency evidenced in earlier studies were related to kinds of restrictions placed on the acceptable response. That hypothesis was not generally supported, although the separate existence of factors describable as *word fluency*, *ideational fluency*, *associational fluency*, and *expressional fluency* was confirmed. In a study of divergent thinking abilities, Guilford, Merrifield, and Cox (1961) tested ninth graders in two school systems. Their battery contained revised forms of tests that were loaded heavily on the hypothesized factors in analyses of adult male samples of relatively high ability levels—e.g., aviation cadets. Their findings not only established the factorial validity for many of the tests at the ninth grade level in terms of identification of the factors that had been hypothesized but also furnished the definition of two new abilities based on tests that had been developed from the rubrics of the structure-of-intellect model. Similarly, Merrifield, Guilford, and Gershon (1963) administered a number of tests to a sixth grade sample and found the same factors as those that had been previously identified for adults. These last two studies seem to indicate that the factor repertoire, and perhaps the dimensionality of intellect, may be essentially the same from late childhood to adulthood. This interpretation counters the allegation that a general factor fully characterizes infant mental ability and that the older the individual, the less will be the importance of the general factor. Such an allegation may be tenable for children less than 12 years of age.

A notable event for those working with special abilities was the publication of the *Kit of Reference Tests for Cognitive Factors*. This kit and the accompanying manual (French, Ekstrom, and Price, 1963) should lead to necessary standardization in the easily dissembled field of measuring special abilities. It is hoped that further efforts will be directed toward increasing the number of factors for which tests are generally accepted by workers in the field.

Predictive Validities

Although the effort did not start with Getzels and Jackson (1962), their book has stimulated a number of investigations, especially of the two hypotheses (a) that teachers prefer *high IQ* to *high creative* students and (b) that the two groups have essentially equal achievement. When one considers the shortcomings of the study, as did de Mille and Merrifield (1962), it is not surprising that the findings were challenged, especially since the early resolution of issues dealing with the accommodating of both creative and intelligent children is of paramount importance. In his presentation of a clean replication of Getzels and Jackson's study of the comparative effects of creativity and intelligence on high school achievement, Yamamoto (1964a) found no significant difference between groups. Following Getzels and Jackson's design, Yamamoto separated his subjects into (a) the high IQ group—children in the top 20 percent on IQ measures but not in the top 20 percent on creativity measures—and (b) the high creativity group—children in the top 20 percent on creativity measures but not in the top 20 percent on IQ measures. However, his subjects, like those of the earlier study, were of generally high IQ. Since the mean of the total group was 118 before its separation into two groups, the point remains that children of such relatively high aptitude should do well in any case, whether they are creative or not.

On another tack, utilizing all the data in a correlational approach, Cline, Richards, and Needham (1963) found that a measure of IQ added very little to the multiple-R obtained for creativity tests as predictors of science achievement for boys, but that there was a small increase attributable to IQ for girls. This result does not support very well the contention that creativity and IQ are opposites, at least with respect to their covariance with high school science achievement of the usual sort.

In a further investigation of his data, Yamamoto (1964b) found that, within the high creativity group at the secondary level, the achievement of children with IQ's greater than 135 was not different from that of children with IQ's between 135 and 120, but that a third group, with IQ's less than 120, had significantly lower achievement scores. One would suspect that, given an IQ greater than 120, the possession of creativity is irrelevant to achievement. Comparing elementary school level children in the same study, Yamamoto found differences in achievement paralleling differences in IQ. Perhaps the tests had a more appropriately high ceiling for the elementary than for the secondary level children.

Finally, against the claim attributed to Getzels and Jackson that teachers preferred high IQ to high creative children—a contention which they did not make explicitly, but did allow to arise by easy inference—Richards, Cline, and Needham (1964) maintained that Getzels and Jackson's instructions to teachers were heavily biased toward IQ criteria. They neatly made their point by asking teachers to rate children on creativity. They found no difference in preference by teachers that could be related to creativity or IQ measures, just as there had been no real difference in Getzels and Jackson's study in teacher preference for students in the high IQ groups.

In a comparative study of convergent and divergent thinking, Klausmeier and Wiersma (1964) reported that girls scored lower than boys on convergent, but higher on divergent, thinking tests. This result is consistent with findings of many other investigators. Children in grade 7 did better than those in grade 5 in both kinds of tests. Children in a large city did as well as their small-town counterparts on convergent thinking but less well on divergent thinking; this last result is intriguingly reminiscent to the reviewer of the old claim that most scientists come from rural areas. The study might have been more concise had the investigators obtained factor scores or even kind-of-thinking scores for comparison, instead of presenting many comparisons in which the tests are, at least by definition, correlated with tests in other pairs. The significance tests for such pairs are not really independent.

Using tests modeled after those factored by Guilford and his associates, Jones (1964) obtained a multiple-R of 0.67 for managers' ratings of creativity of industrial chemists, predicted from measures of logical reasoning, mathematical reasoning, ideational fluency, originality, and five attitudinal variables. In a study of seventh graders, Merrifield, Gardner, and Cox (1964) found that teachers' ratings of what the authors called a "problem-solving syndrome," which was made up of several separately rated traits, was predicted to a significantly greater degree by a composite of IQ scores, aptitude scores, and temperament trait scores than it was by IQ scores alone.

Petersen and others (1963) observed that a larger number of separate abilities appeared to contribute to success in algebra than to success in general mathematics at the ninth grade level. The patterns of abilities for the two groups also differed. Furthermore, the addition of measures from factor tests—taken from those in the structure-of-intellect armamentarium —to measures from standard tests increased the multiple-R for algebra achievement but not for general mathematics achievement.

Merrifield and others (1962) showed that performance on tasks designed to measure problem solving could be predicted in part by measures of the abilities called conceptual foresight, sensitivity to problems, and originality.

Additional Reference: Super and Crites (1962).

New Measures

The reader will have recognized by now that the reviewer is personally involved in much of the recent research concerned with special abilities.

Accordingly, and with a modicum of apology, this section begins with citations of several studies stemming from Guilford's laboratory. Guilford and Merrifield (1960) presented a detailed formulation of the structure of intellect and offered suggestions for its use in the development of new measures of ability. Subsequently, Guilford and others (1961) reported the discovery of factors in cognition and convergent thinking dealing with symbolic material—i.e., numbers, letters, other arbitrary signs. Using the same battery for adults as has been employed for ninth graders, Gershon, Guilford, and Merrifield (1963) found evidence for several factors in the area of divergent thinking with figural material—space forms, shading, and other perceptions not having familiar meanings. Guilford and others (1962) reported their initial efforts in developing tests to measure abilities in the area of behavioral (social) intelligence—the ability to think about the thoughts and feelings of others. Results since 1960 were summarized by Guilford and Hoepfner (1963).

Elsewhere, Stott and Ball (1963) carried out an extensive investigation of interitem correlations of infant and preschool tests. Factor analysis showed rather clearly that each of the different tests contained several factors and that there was little concordance of one test with another. It is not surprising that the degree of prediction of Binet-type IQ measures has been so low. Since the factors differ, there is little opportunity for correlation to ensue.

Lesser, Davis, and Nahemow (1962) presented a test of scientific talent in elementary school children of high general ability. The test is said to call for eduction of scientific principles implicit in early items; administration is individual, with oral response being the rule.

Nunnally, Flaugher, and Hodges (1963) devised an interesting test to measure whether the respondent tends to evaluate, to denote, or to categorize. Reasonably high estimates of reliabilities were reported. It may be that the test will measure an attribute, knowledge of which will be helpful in academic or vocational placement.

Summary

What, then, are the trends in the measurement of special abilities? One sees, for the immediate future, the continued active development of orthogonally depicted measures of separate abilities, probably within the plan of the structure of intellect. The issues of validity, reliability, and score distribution will receive greater attention, especially in the area of test development.

It is near the time when teachers must face the problem of training children whose abilities are demonstrably different in detail. It will not be enough to enhance those abilities already emergent in the child—such an approach could lead to a nation of specialists unable to communicate outside their specialties. Educators must attend also to the development of abilities in the child who has not become aware of his potential, so that as an adult he may be more capable of coping with changing requirements in an unstable world. Perhaps the major characteristic of the Renaissance man was his ability to cope with his changing environment, albeit sometimes flamboyantly. There is a groundswell, not yet strong enough to be well documented, intimating that programed learning performance is sensitive to individual differences; perhaps programs to enhance special abilities as well as to impart facts will be developed.

In the area of prediction of appropriate criteria, there will be, as always, concern with the criterion problem. It may be fruitful to carry out logical analyses of criteria in terms of known and hypothesized special abilities, rather than in terms of segments of the composite task on which the criterion measure is typically based. With the availability of computers as well as the promise of new tests for use as predictors, one may expect a continued increase in multivariate analysis—multiple-regression, discriminant analysis, profile analysis—appropriate to the requirements of multifaceted problems involved in the measurement of special abilities.

Man's thinking, like his love, is a many-splendored thing.

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CHAPTER IV

Trends in the Measurement of Educational Achievement

HAROLD F. BLIGH

Conditions in American education since Merwin and Gardner prepared their chapter concerned with tests of educational achievement in the February 1962 issue of the REVIEW have been favorable to the development of systematic research in the field of achievement testing.

In its provision of funds and materials available for research, the National Defense Education Act focused attention on the need for controlled studies that could be replicated. In addition, grants made available by the U.S. Department of Health, Education, and Welfare and by other governmental and private agencies served to encourage the initiation and completion of systematic and intensive research. The availability of accurate, economical central-scoring and data-processing facilities opened up to test publishers as well as to other test developers opportunities to enlarge samples and to execute studies involving detailed experimental designs.

During the past year, two new journals appeared. Under the editorship of Schutz (1964), the *Journal of Educational Measurement*, official publication of the National Council on Measurement in Education, publishes original research and reports of applications of measurement. Published by the American Educational Research Association and edited by Davis (1964), the *American Educational Research Journal* furnishes reports of experimental and theoretical studies in education. The inclusion of the "Validity Studies Section" (Michael, 1953) in *Educational and Psychological Measurement* served to encourage publication of reports of the performance of achievement tests at local levels in practical testing situations. It is hoped that more persons carrying on research at the local level will design their studies with the view of publishing the findings in one of the several available media.

Test Development

Objectives and Content

Hoffmann (1962) severely criticized objective tests—especially those employing multiple-choice items—as representing merely superficial measures of factual recall. He contended that they discriminate against the bright, discerning student. In an attempt to demonstrate that multiple-choice items can be valid instruments for measuring thought, insight, and understanding, the staff of the Test Development Division of the Educational Testing Service (1963) not only prepared representative samples of multiple-choice questions accompanied by statistical analyses of item performance but also included brief discussions of the thought processes involved. Although valuable as a guide to item writers, this descriptive report did not offer experimental evidence that the items performed as intended.

McGuire (1963) and Stoker and Kropp (1964) attempted to describe the cognitive processes that test items were intended to measure. In the McGuire study, three subject matter experts independently classified 683 items according to an eight-level taxonomy of intellectual processes that was adapted from Bloom's (1956) *Taxonomy of Educational Objectives.* The raters unanimously agreed on the classification for 61 percent of the items rated; on an additional 13 percent, one rating diverged from the other two by only one level. Two or more of the raters agreed on 93 percent of the items. An attempt to determine the degree of correspondence between the intellectual process actually employed by examinees and that described by the experts provided results of limited usefulness.

From statistical analyses of results for a comprehensive examination constructed according to a revised taxonomy, McGuire concluded that the items at each level of the taxonomy appeared to be measuring somewhat different intellectual skills. Findings from factor analysis of the correlational matrices supported the hypothesis that there is a fundamental kind of knowledge, understanding, or intellectual skill basic to all processes.

Stoker and Kropp used two reading comprehension tests in which items were distributed over the six major categories of the *Taxonomy of Educational Objectives.* Agreement among judges independently classifying the items was sufficiently high to warrent the conclusion that raters tend to categorize test items with respect to the cognitive processes sought in the items. In general, the data supported the hierarchical structure of the *Taxonomy*, with a possible misplacement of the evaluation category.

In a novel approach, Connolly and Wantman (1964) explored the feasibility of tape-recording the responses of examinees as they thought aloud in responding to objective test items. This exploratory study, which was based on a limited sample of nine subjects, pointed up some of the difficulties experienced by McGuire (1963) in drawing sound conclusions from her findings.

With the advent of modern curricular reform, especially in the fields of mathematics and science, test developers are faced with the problem of devising achievement tests to measure instructional goals not adequately tapped by existing instruments. Heath (1964) attempted to identify four types of cognitive preference in high school physics and to compare them with conventional and Physical Science Study Committee courses of study. Data from the Cognitive Preference Test: High School Physics, written especially for the study, supported Heath's contention that the cognitive preference exhibited by students in the conventional and new science courses may be expected to differ significantly. Achievement tests structured according to traditional objectives appear to be inappropriate for assessing the goals distinctive to the newer curriculums.

Mayo (1964) and Rust, Jones, and Kaiser (1962) used different approaches to describe test content. Mayo reported preliminary findings of an attempt to define competences in measurement that are needed by the beginning teacher. Persons who were generally recognized as having the background to judge what the beginning teacher ought to know about measurement rated 70 competences expressed in behavioral terms. Collectively, the judges felt that the majority of the competences were important; only 2 of the 70 statements were rated "of little importance" by a majority of the judges. Statistical concepts were considered to be least important, whereas competences associated with criteria for selection and use of standardized tests and with the construction and evaluation of classroom tests were judged as "high."

Rust, Jones, and Kaiser explored the domain of critical thinking by factor-analyzing 21 subtests derived from *Watson-Glaser Critical Thinking Appraisal*, the *American Council on Education Test of Critical Thinking*, and A Test on Principles of Critical Thinking devised by the staff of the Illinois Critical Thinking Project. They identified two strong factors: general reasoning and language discrimination. A third factor, labeled verbal understanding, was not clearly defined.

Additional References: Costin (1963); Heath (1964); Hipsher (1961); Hurst, Ronning, and Bartlett (1961).

Technical Aspects

Research on the more technical aspects of test construction was spotty, with a wide range of topics being explored. In a series of four well-defined experiments at the college level, Brenner (1964) investigated the effect of different orders of item difficulty on estimates of discrimination, reliability, and difficulty level of four-option multiple-choice tests of educational psychology. He found that there were no significant differences for test difficulty and test reliability and that only one of the four differences in discrimination value was significant at the 0.05 level. It appeared that classroom instructors gained little from the time and effort spent in arranging items of a power test of facts and principles in order of item difficulty.

The extent to which test scores are contaminated by the effects of response sets, chance, failure to attempt all items, and like factors concerned test theorists and test users alike. Hopkins (1964) discussed the effects of response styles and concomitant chance variance on the *California Achievement Tests (CAT)*, *SRA Achievement Series*, and *Iowa Tests of Basic Skills*. In certain instances, a score near to or even at grade level status was obtainable by chance performance alone. Conventional reliability estimates for total scores on the *California Arithmetic Test* and for scores in the reasoning portion of the arithmetic test in the *SRA Achievement Series* were nearly identical, whereas the differences in their respective extrinsic reliabilities were highly significant. The author suggested two approaches to the attenuation of irrelevant variance: (a) the development at every grade level of several test forms differing only in difficulty and (b) the adoption of differential scoring methods at various ability levels.

In a well-designed study at the college level in which he used data from four alternate test forms of 100 items each, Marcus (1963) investigated the influence of position response sets on scores of a multiple-choice achievement test. The influence of position response sets, which was neither stable nor fixed, shifted from test form to test form and, in the main, was negligible. He concluded that a promising line of research would be to study the sequential effect from item to item and the effects of equalizing attractiveness of the distractors.

Two studies were concerned with the effectiveness of item analysis procedures. Using scores on an essay test as a criterion, Myers (1964) applied four item analysis techniques to a multiple-choice test of 32 items. Results for an item analysis sample with 300 cases and for three cross-validation samples each containing 100 cases showed the item-test biserial correlation, the item reliability index, the standard length of the item, and the ratio of the item validity index to the item reliability index to be about equally effective procedures in identifying items to comprise reliable and valid tests.

Feldt and Hall (1964) studied the sensitivity of four commonly used discrimination indexes to variations in the average achievement level of the examinee group on which they were based. Flanagan's approximation of the product-moment coefficient, the Davis transformation of the product-moment coefficient, the Gulliksen item reliability index, and the difference between the proportion of correct responses in the upper and lower 27-percent groups were derived for multiple-choice items in four subject areas and for six reference populations. None of the discrimination indexes was independent of the achievement level of the population studied. The mean values of each index, which differed significantly among the reference groups, tended to rise as the ability of the reference group increased. There was a marked relationship between item difficulty and item discrimination within a single set of items. It would appear that test constructors should examine carefully the discriminating power of items at successive grade or ability levels as well as the progression of item difficulties over the range covered by a test.

Sax and Reade (1964) investigated the effects on achievement of varying difficulty levels of tests given in a required course in educational measurement. The index of test difficulty was expressed as the ratio of mean score to number of test items. Bright students who took difficult examinations did obtain significantly higher scores than did equally bright students taking easier examinations. The difficulty level of the tests was independent of achievement for students in the lower half of the class.

The authors suggested that teachers use fairly difficult examinations to motivate bright students during the semester and easy examinations for grading purposes at the end of the semester.

Archer (1962) studied the effect on test reliability, concurrent validity, and item characteristics of three methods of responding to multiple-choice items. In comparison with a conventional approach, the two experimental approaches—elimination and free choice—failed to provide information that was either more reliable or valid. The elimination procedure was superior to the free choice method with respect to reliability, but not with respect to validity. Relative item difficulty was little affected by the method of response. Stability of item difficulties across procedures was noted for easy and difficult items as well as for items of average difficulty. Higher levels of item discrimination were associated with the conventional method, especially for easy items.

The use of formula scoring to correct for random guessing on objective test items has not proved to be completely satisfactory in situations in which examinees' willingness to guess differed considerably. Lord (1964) reported empirical findings that showed the amount of loss in test validity that would have resulted if each examinee had randomly guessed instead of omitting certain items. Test intercorrelations consistently declined from 0.03 to 0.06 when randomly chosen responses were substituted for omitted responses on both tests. These findings suggest that the practice of requiring each examinee to answer every item on a test should be viewed with caution.

In investigating the relationship of formula scoring to validity, Lord (1963) applied a mathematical model to seven hypothetical tests. For five-choice items, formula scoring produced a gain in validity about equal to that produced by lengthening the test by 20 percent or more. For two-choice items, the increment in validity was greater than that which could be produced by extending the test to any length whatsoever. He concluded that formula scoring appears to be relevant when (a) the examinees vary widely in propensity to guess, (b) the number of choices per item is fewer than five, and (c) the test is quite difficult for the group tested.

Vernon (1962) carried out an investigation designed to elicit the relative variance associated with test content, method, and error components with a group of 108 British and 75 American college students. The general trend of the results did not support the author's initial hypothesis that certain weaknesses in current achievement tests, such as poor differential predictive capacity, may result from neglect of method of responding to a test. A reading test in which questions were neither seen nor answered until after reading of the passage was completed appeared to be measuring a somewhat different ability from that measured by conventional reading tests involving immediate comprehension. The former test was considerably more valid than was the latter in the prediction of academic achievement. Test questions to which students wrote their response words did not seem to involve an ability different from that measured by multiple-choice items.

Several studies were concerned with college students' attitudes toward test formats and testing procedures. In a limited investigation involving 55 college students, Feldhusen (1964) discovered that students' reactions to frequent quizzes were highly favorable; post-mortem discussions of quiz performance were less favorably viewed. Nevertheless, three-fourths of the students felt that such discussions helped them to avoid foolish and technical errors in subsequent testing. Using 19 pairs of college students matched on mental ability and factual knowledge of American government, Selakovich (1962) found no significant difference between the group given frequent tests and the group tested only three times a year. The experimental group was strongly in favor of frequent testing.

Gustav (1961) investigated college students' preference for test formats and the relationship of such attitudes to grades earned. Student responses to a questionnaire administered during the first week of the term were tabulated and compared with other test scores. Only a weak relationship was discerned between test grades and expressed preference for test format.

Additional References: Boag and Neild (1962); Calhoun (1962); Feldhusen (1961); Glass and Wiley (1964); Graham (1963); Gruber and Weitman (1962); Gustav (1963); Hawes and Helmstadter (1963); Little (1962); Lord (1964); Myers (1962); Rimland and Zwerski (1962); Sax (1962); Wevrick (1962).

Techniques of Administering and Scoring

The growing popularity of radio and television as media of instruction gave rise to a series of investigations into the feasibility of various modes of item presentation. The most extensive investigation was that reported by Curtis and Kropp (1962). By projecting all the directions on a viewing screen, they explored the possibility of administering group standardized tests. For achievement tests, the projected audio presentation seemed to result in scores not differing from the projected silent or conventional administrations. However, audiovisual presentation may have been audio for some subjects, visual for others, and audiovisual for none or very few. Adaptation of computational arithmetic items to the experimental mode of testing presented difficulties because of differences in kinds of abilities evoked by differing techniques of test administration. The authors tentatively concluded that the exposure of three items simultaneously—one of average difficulty, one of more than average difficulty, and one of less than average difficulty—did yield results more similar to those obtained from conventional administration than did other modes of exposure.

Burr (1963) studied the relationship among sets of scores earned by sixth graders on the social studies test of the *Metropolitan Achievement Tests.* He used three modes of item presentation that were employed in the foregoing investigation in conjunction with two modes of instruction—televised and traditional. The projected silent and audio-reinforced projected presentations produced results comparable to those obtained from conventional administration for both modes of instruction. The experimental techniques utilized less time than the conventional approach.

Long (1962) found supporting evidence for Burr's tentative conclusion that if audio reinforcement of visually projected directions does affect test performance, such effects will be found at a reading grade level below 4.7 and above 8.7. He reported significant differences between the mean scores of educable mentally retarded elementary and secondary school pupils on subtests of the *Stanford Achievement Test* concerned with word meaning and arithmetic reasoning relative to whether they were examined in the conventional manner or given oral reinforcement of the directions, item stems, and response options.

With the advent of new scoring machines in which a variety of answer space configurations and color designations is employed, the question of possible effects on answer-marking performance arises. Test users should rightly ask whether the norms derived with one answer medium apply to scores obtained with differing types of answer media. Published reports of research in this area were limited, especially reports in readily available and well-known professional journals.

Using three samples varying widely in age and educational experience, Miller and Minor (1963) compared eight potential new multiple-choice answer forms to the standard IBM 805 answer sheet form in an attempt to determine whether an answer form could handicap a person's test performance and thus invalidate established test norms. Of three criteria studied (total right responses, total erasures, and total double marks with no erasures), only total right scores reflected differences that were statistically significant and judged to be of practical importance. Differences among forms were attributed both to the configurational factors involved in the grouping and to the labeling of the answer slots. Vertical grouping of slots and failure to label each slot with an individual number seemed most detrimental to answer-marking performance for all three age groups. Three of the experimental styles appeared to be unsuitable for use with tests standardized on IBM 805 forms.

Additional research is needed on the possible influence of color, format, and other adaptations entailed in the change to an answer medium differing from that used in standardizing a test. Although results may show no significant differences in mean performances, consideration should be given to significant discrepancies which may occur at other points in the score scale, particularly at the lower end.

Additional References: Gerlach and others (1964); Kropp and others (1962); Loiselle (1964); Slater (1964).

Reference Groups and Norms

It has been generally accepted that norms on elementary achievement tests differentiated with respect to sex or locale of the country add little to the interpretation and use of the test results. During the past three years, there has been some empirical research that suggests that further consideration be given to the differentiation of test norms.

In two well-designed studies, Bauernfeind and Blumenfeld (1963) investigated possible differences in educational achievement of public and Catholic school pupils as measured by the *SRA High School Placement Test* at the eighth grade level. Pupils matched for general reasoning ability, sex, and geographic region were compared on the arithmetic and reading tests in the first study and on the language arts, arithmetic, and reading tests in the second study. In the first analysis, Catholic school pupils earned mean grade equivalents approximately one year above those of pupils in public school on the two criterion tests; in the second analysis, the mean grade equivalent scores for Catholic school pupils were 0.45 years higher on all three tests. All differences were significant beyond the 0.01 level.

Using a stratified sampling technique, Wozencraft (1963) found a real sex difference in favor of girls for total groups and for average ability groups in the third and sixth grades, when they were tested with the *Stanford Achievement Test.* At the third grade level, girls in the total and average groups were superior in all four areas tested; at the sixth grade level, girls in the total group excelled the boys in average scores in reading, arithmetic computation, and the arithmetic composite. In the average ability group, the significant differences existed only in arithmetic computation and in the arithmetic composite.

Parsley, Powell, and O'Connor (1964) analyzed results on the *CAT* for an entire school population, grades 4-8, and found that significant sex differences did exist within three achievement levels for various IQ groups. In general, the results indicated that girls excelled in reading achievement and in arithmetic fundamentals, whereas boys tended to excel in arithmetic reasoning. On the basis of their findings, the authors advised against the use of average scores or a composite of measures in arithmetic.

In the Project Talent report, *The American High-School Student,* Flanagan and others (1964) noted the following general findings on sex differences in achievement among high school students: (a) on a test of information, girls in grades 9-12 did finish slightly more items on the average than did boys; (b) almost all the variables for which the reliability coefficient was markedly lower for one sex than for the other involved subject matter in which there were marked sex differences in amount of interest; (c) the high degree of similarity between the correlational patterns of various tests and groups of tests suggested that the factorial composition of the tests was apparently much the same for boys as for girls; (d) little difference between boys and girls existed throughout the middle and top of the distribution of scores on a test in reading comprehension, although toward the bottom of the distribution boys scored lower than girls; (e) girls exceeded boys on a test in arithmetic computation at grade 9, but by grade 12 there was little difference; (f) sex differences in a test concerned with arithmetic reasoning and in an achievement test covering intermediate high school mathematics were not significant, although by grade 12, scores for the boys were substantially higher; and (g) boys obtained higher scores on tests of vocabulary at all grade levels. This last finding might be attributed to difference in subject matter content from which the vocabulary words were taken.

Miller and Minor (1963) found that females did achieve consistently higher total rights-scores than did males on each of eight forms of answer media. They suggested that sex differences in substitution tasks such as those evoked might be less a function of association learning than of fundamental perceptual motor skills. Further investigation is needed before one may conclude that tests administered with standard answer forms favor girls regardless of test content.

Norms and expectancy tables were compiled to supplement those given in test manuals. Wrightstone, Aronow, and Moskowitz (1963) derived norms on the *Metropolitan Achievement Tests, Elementary Reading Test, Test 2: Reading* from the raw scores of 5,307 pupils in 73 special schools for the deaf in the United States and Canada. Percentile ranks were reported for age groups rather than for grade groups; stanines referred to as Standard Reading Ratings were based on all subjects, irrespective of age or grade.

Additional References: Feldmann and Weiner (1964); Hall (1963); Parsley and others (1963).

Interpretation

Values to be gained from interpreting achievement test scores in relation to capacity as measured by an intelligence test were recognized. Durost (1962) discussed the importance of such comparisons and stressed the use of the bivariate chart in illustrating relationships. He advocated that the scores on the tests be expressed in units that are directly comparable; that is, in terms of local stanines. Engelhart (1962) likewise described the advantages to be gained from applying stanines to the interpretation of achievement and mental ability measures.

Juola (1961) analyzed ways in which one may relate several relevant ability measures to a criterion so that the results will be meaningful to administrators, counselors, and students. He contended that the expectancy table approach was particularly advantageous because the entries in the cells of the table appear as easily understood probability figures expressed in percentage forms.

Using standardization data for three achievement batteries and six independent populations at five different grade levels, Mitchell (1963) investigated the feasibility of applying expectancy tables based on data for individual pupils to the interpretation of school averages. On the basis of 49 comparisons of the regression line for individual pupils with that for school means, she concluded that correspondences set up through either approach exhibit reciprocal applicability.

Discriminant analysis appears to offer promise as a technique for interpreting results from achievement tests. Using the six subtests of the *CAT*, Anderson and Leton (1963) performed a discriminant analysis between each pair of adjacent grades, 4-12. Equations that optimized classification of students as a linear composite of the six subtest scores were derived. Better discrimination was obtained throughout grades 4-8 than in later grades. Using the same sample, Leton and Anderson (1964) concluded that arithmetic variables were relatively important delineators, with arithmetic fundamentals carrying the largest weight at the elementary level and arithmetic reasoning becoming dominant thereafter. Reading variables seemed relatively important throughout all grade levels. Vocabulary was more important in the lower and middle than in the upper grades, and comprehension was more important in the upper grades than in the other grades. The spelling variable was a very strong discriminator at the senior high school level, although it did not contribute much below that level. The English variable did not carry a very effective weight at any of the grade levels. From the standpoint of discrimination, it could very probably have been dropped from the equations without serious loss of efficiency in classification.

Two studies pertained to the use of gains in scores on achievement tests as measures of growth. Weiner and Howell (1964) analyzed differences in scores earned by 20 pupils tested on consecutive years with the spelling subtest of the *Stanford Achievement Test*. The estimate for the reliability of the score gains was found to be 0.37. Analyses of case records for five pupils with large gains and for five pupils with negative gains did not increase the confidence of the authors in score differences as measures of individual pupil growth in achievement.

Findley (1962) developed tables of expectancy norms based on growth of groups with equal initial achievement. He concluded that this procedure overcame many of the difficulties inherent in other methods of interpreting average test scores for several schools in a system.

Additional References: Dailey (1963); Sarason (1961); Scott (1963).

Comparability of Tests and Test Scores

The problem of comparability of test scores continued to be an enigma to test developers and test users. Two aspects of the problem were generally recognized: (a) the nonequivalence of norm groups and (b) the marked content differences of tests intended to measure the same traits. During the past three years, several well-planned studies were concerned with at least the first of these two aspects.

Taylor and Crandall (1962) compared the complete battery of *CAT*, *Iowa Tests of Basic Skills*, *Metropolitan Achievement Tests*, *Stanford*

Achievement Test, and the *SRA Achievement Series*. They used fifth and eighth grade groups that had been matched on a variety of factors, including mental ability as measured by *The Henmon-Nelson Tests of Mental Ability*. Wide variations in mean grade placement were reported among the tests. In general, pupils taking the *CAT* consistently earned higher grade placement scores, whereas those taking the *Metropolitan Achievement Tests* tended to earn lower scores.

Using the *Iowa Tests of Basic Skills, Metropolitan Achievement Tests*, and *CAT*, Finley (1963) attempted to make the content more nearly comparable by limiting a study to reading comprehension, arithmetic reasoning, and language usage. Finley's findings supported previous results that *CAT* scores (1957 norms) did tend to run consistently higher than did scores on other test forms—in some cases as much as a year higher on the average. Differences between *Metropolitan* and *Iowa* tests were nonsignificant except for language usage, for which the *Metropolitan* average was lower than the *Iowa* and *CAT* averages.

Although recognition of theoretical and technical problems involved in establishing comparable scores for nonparallel tests was voiced by leading test theorists, little empirical information was reported in the literature. Angoff (1964) considered tables of comparable scores to be limited since their usefulness is a function of (a) the similarity of the tests for which comparable scores are to be developed; (b) appropriateness of the groups on which they are based; and (c) the amount of error that can be safely tolerated for the specific use under consideration. He defended the development of comparability tables that are derived from differentiated norm groups over those based on national norm or local norm groups. Lennon (1964) reported the development of sets of scores for end-of-course tests in the *Evaluation and Adjustment Series*, which had been rendered comparable through use of an anchor test approach. A student's score on any one of the tests in the series denotes the same relative performance in a hypothetical population having a specified mean or standard deviation on the *Otis Quick-Scoring Mental Ability Tests, Gamma Test*.

Additional References: Baker (1964); Bereiter (1964); Cassel (1963); Ebel (1961); Flanagan (1964); Lindquist (1964).

Prediction and Classification

Prediction and validation studies of the nature of those reported in the "Validity Studies Section" of *Educational and Psychological Measurement*, in bulletins of the Educational Records Bureau, and in various state publications contributed to improved understanding of the performance of specific tests with well-defined academic groups. Numerous studies pertaining to a wide range of test and age levels were found. The reports of Anderson (1961a, b) and of Flanagan and others (1964) were of general interest.

At the elementary level, Anderson found that the *California Test of Mental Ability* contributed little to the prediction of midterm grades in reading, arithmetic, language, and spelling at the fourth and sixth grade levels when it was used with *CAT* subtests, which were administered near the grading period.

In an analysis of Project Talent data for twelfth grade boys, Flanagan and others found that those tests most directly related to high school subjects and those having very high components of general verbal ability best predicted whether a boy will enter college. Exhibiting a zero-order correlation of 0.52 with college entrance and the largest beta weight, a test of mathematics information was the best single predictor and the best predictor in a combination of 51 test variables. The second part of a mathematics test, which measured abilities of somewhat the same nature as those in the test concerned with mathematics information, carried the second largest beta weight.

There was continuing use of achievement tests during the past three years for identifying and describing the characteristics of underachieving and overachieving pupils. Recognition was given to methodological weaknesses and faulty designs in previous studies as well as to the need for defining operational procedures so that replication would be possible.

Techniques for selecting underachieving and overachieving samples were classified and compared in two studies. Farquhar and Payne (1964) recognized four somewhat distinct classification techniques. Comparisons were made of seven operational procedures that had been utilized in published studies and of a regression procedure that had been developed according to characteristics of an ideal selection technique. The number of individuals identified as underachievers and overachievers differed greatly relative to the particular technique used. There was a wide sex difference in the number of individuals selected by various techniques.

Pippert and Archer (1963) found that grade point average and composite score on an achievement test failed to identify the same ninth graders as underachievers. Underachievers selected by achievement test scores performed significantly lower on criterion measures than did those students who were identified on the basis of grade point average.

Outstanding theoretical contributions were made by Thorndike (1963) and Willingham (1964) through their attempts to clarify the construct of relative achievement and to prescribe conditions under which more meaningful research could be conducted. Thorndike reviewed existing research studies on underachievement and overachievement and pointed out methodological pitfalls arising in part from defective experimental design and in part from inherent deficiencies in the terms used to denote relative achievement. He recommended precautions to be observed in designing future research in this area.

Willingham defined relative achievement in terms of two measures: (a) overachievement or underachievement and (b) overpredictedness or underpredictedness. He outlined several necessary conditions for the evaluation of relative achievement and pointed to the need for empirical research designed within carefully formulated frames of reference.

Additional References: Boe (1964); Crouch (1962); Gnauck and Kaczkowski (1961); Haney, Michael, and Gershon (1962); Michael and others (1961); Pauk (1963); Richards and Taylor (1961); Swanson and Berdie (1961); Wellck (1963); Yager and Dessel (1963).

Evaluative Studies

Only brief reports of studies evaluating new tests or revised tests were available. Oldridge (1964) reported on the concurrent validity of the reading and arithmetic sections of the *Wide Range Achievement Test* (*WRAT*), which was administered to seventh graders one week after the *CAT* had been given. Correlations of the scores on two subtests of the *WRAT* with scores on the arithmetic and reading subtests of the *CAT* and with total scores on the *CAT* ranged from 0.65 to 0.80 with a median of 0.72. Although the *WRAT* did tend to yield lower grade placement scores than did the *CAT*, the differences were not significant. Possible effects of practice and/or interim learning were not investigated.

Three studies were concerned with subtests of the *Sequential Tests of Educational Progress* (*STEP*). Using a random cluster sample of fifth grade pupils, Anderson and Baldauf (1963) investigated characteristics of Form 4 of the *Listening Test*. The coefficient of equivalence was 0.74. The coefficient of stability for Form 4A was 0.74; for Form 4B, 0.88. Correlation of scores on the *Listening Test* with total scores on the *Stanford Achievement Test* was 0.20 when mental ability was held constant. Results from factor analysis indicated that the factor of verbal comprehension seemed to account for over half of the variance.

Gega and Karlsen (1962) studied performances of fifth and sixth grade pupils on the regular form of the *STEP* science test and on a version in which the items were recast in a self-contained form unrelated to the regular situational format. They concluded that format made no difference.

Using a 10-percent random sample of the entire group of approximately 9,000 students tested in the 1957 National College Testing Program, Fortna (1963) performed a factor analysis with the *STEP* and the *School and College Ability Tests* (*SCAT*). The *SCAT* verbal, *STEP* reading, *STEP* writing, and *STEP* social studies tests had the highest loadings on a verbal comprehension factor, whereas *STEP* mathematics, *SCAT* quantitative, and *STEP* science tests defined the numerical facility factor. A third factor, unnamed, was significantly loaded in the *STEP* writing test.

Additional References: Anderson and Slivinske (1963); Hopkins, Dobson, and Oldridge (1962); Howell and Weiner (1961); Leton, Anderson, and Stier (1963); Sheppard and Campbell (1963).

Conclusion

During the past three years, there have been noticeable improvements in the design and quality of research studies pertaining to tests of educational achievement. Attempts to delineate fundamental issues and to formulate theoretical constructs or frameworks have been particularly fruitful. However, additional consideration needs to be given to precise planning of empirical investigations so that the time and efforts spent in implementing them will not be wasted.

The designing of achievement tests to assess the educational goals being stressed in newer curriculums offers a real challenge, especially when instructional emphasis is placed on development of concepts and understanding rather than on acquisition of knowledge and application of facts. The attempt to describe the cognitive processes sought in test items appears to be a start in the right direction. Existing item types need to be refined, and new approaches need to be developed if these newer goals are to be assessed in an adequate manner.

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CHAPTER V

Trends in the Measurement of Vocational Interest

JOHN N. MC CALL

In addition to material published during the 1961-64 review period, some earlier references will be cited in this chapter. Lack of a previous major review on interest measurement as well as the writer's wish to present a broader perspective prompted the decision to extend the period of coverage. Excellent general reviews appeared in the volumes by Darley and Hagenah (1955) and Super and Crites (1962) as well as in the papers edited by Layton (1960). The more technical problems concerned with the construction of interest inventories were discussed by Kuder (1957), Ghei (1959), Clark (1960), and Layton (1960).

Past Trends

Accepted Methods

In their distinction between *expressed, manifest, tested,* and *inventoried* interests, Super and Crites (1962) described major ways in which applied psychologists measure vocational interests. The most widely accepted method by far has been the inventory approach, in which subjects indicate their preferences, or relative likes and dislikes, for a long list of specific items. Criteria for selecting items and for scoring them relative to specific scales have been (a) conformity to standards of logic or common sense, (b) homogeneity of items as reflected by high intercorrelations among items within a cluster and low correlations with items in other clusters, and (c) empirical differentiation, in which item responses for members of selected occupational groups must differ from the responses of individuals in a relatively general reference group.

The two most thoroughly researched instruments are the *Kuder Preference Record—Vocational* and the *Strong Vocational Interest Blank for Men.* The former illustrates homogenous keying, or scale construction, whereas the latter illustrates empirical keying. The ease of scoring and reading comprehension as well as the inclusion of broadly defined activity areas have made the *Kuder Preference Record—Vocational* a popular instrument. Evidence which has pointed to considerable stability as well as to long-term predictive validity for the *Strong Vocational Interest Blank* (*SVIB*) has helped to establish it as both a research and counseling tool, although it is best used with persons who are oriented toward the professional and higher level business occupations.

Persisting Problems

Finding an acceptable taxonomy of interests remains a vexing problem. To assume that interest scores reflect intrinsic satisfaction with given tasks, or occupational activities, seems to suggest an easy solution. Actually, there is no clear-cut, completely objective system of occupational classification. Existing schemata, which are quite arbitrary, often invoke use of overlapping criteria of classification. Many jobs with the same name differ considerably. Moreover, persons in a given job may utilize different psychological functions. Factor analysis has been used both to identify dimensions of interests within a large cluster of items and to find which dimensions best describe the intercorrelations of measures for existing inventories or for their subscales. In their useful summary of the factors obtained in several studies, Super and Crites (1962) furnished evidence of considerable agreement in the identification of the factors. More research is needed to give these factors psychological meaning.

Empirically keyed scales, such as those in the *SVIB*, name interests simply in terms of the occupational group that is differentiated from a general reference group. Since the duties of the personnel within a given occupation change with time, revisions are necessary. It is also impractical to develop scales for all occupations. In addition, some form of ordering schema with existing scales is needed. Strong's method of grouping closely intercorrelated scales was a partial solution. However, it has been difficult to interpret the interests common to some of these occupational groups. Another complication is the possibility that any given organization of interests changes with age or with progress into different stages of social responsibility. For example, the various intrinsic and extrinsic determinants of work satisfaction and occupational choice might shift as an individual changes from a self-expressive to a more socially responsible adult role in society.

Basic to the discussion of the preceding paragraph is Berdie's (1960) point that there has been no sound theoretical basis for vocational interest measurement. Consequently, there is no meaningful way in which one may compare scores based on different measurement operations. There is also the difficulty of specifying the relative strength of interests. Criteria such as the size of a single score, or of several related scores, and the rank order of scores are not easily justified. This criterion problem is especially difficult for ipsative scales, such as the *Kuder Preference Record—Vocational*, and for the *SVIB*, which measures how much groups differ in spite of their overlapping interests. In more general terms, the profession of psychology is far from the point where interests can be directly translated into psychological processes concerned with motivation, learning, and personality.

Several purely technical problems persist with interest inventories. Among these problems are (a) the use of unit versus multiple item weighting, (b) the optimal number of items to include in a scale, (c) the proper choice of reference or normative groups, and (d) ways to overcome irrelevant response sets.

Current Trends

Newer Scales

A significant extension of the empirical keying method to skilled trade interests was reported by Clark (1961). His *Minnesota Vocational Interest Inventory* (*MVII*) was the outcome of extensive research that began in the 1940's with Navy enlisted men. The current civilian form consists of 570 items in 190 triads; within each triad, subjects choose the most and the least liked activity. Single items are scored by a unit-weighting system, and fewer than 40 items are scored for each of 20 different occupations. Clark described the research and reasoning which went into decisions about item selection and item scoring. He also included data on the predictive validity of scores against choice of technical courses and subsequent course grades.

The value of the *MVII* for high school boys remains under study. There are difficulties with its vocabulary level and with the amount of time needed by some boys to answer the items.

Problems with response set were considered in two ways. Campbell and Trockman (1963) supplied a verification scale based on the infrequent responses by Clark's adult tradesmen. It clearly distinguished scores obtained from college males who took the *MVII* under a normal set and under a set to randomize answers. The tendency to answer in terms of item position within a triad rather than in terms of item content appeared to be negligible. Campbell and Sorenson (1963) had subjects retake the same items located differently within the triad and found corresponding changes in position preference.

The relatively new, criterion-keyed *Kuder Preference Record—Occupational*, Form D, also received attention. Factor analyses were aimed at providing a meaningful way to group the more than 40 occupational scales on a profile sheet and at determining whether the same profile sheet could be used for males and females. Although Schutz and Baker (1962) found quite similar factors for male and female freshmen at Arizona State University, the occurrence of sex differences in means, standard deviations, and factorial complexity for given scales raised some doubts about interpreting scores in the same way. The factors themselves closely paralleled factors summarized from previous research by Super and Crites (1962). Six of the seven factors were found in a near-replication by King and Norrell (1964) with Michigan State University male freshmen.

Hornaday and Kuder (1961) also considered the need for separate scales or norms for the two sexes. Scores for 10 occupational scales were obtained for the fathers and mothers of a student sample and for females employed in similar occupations. In 9 of the 10 occupations, male keys differentiated women as well as men from the basic male reference group. The exception was the key for librarians. It might be that different job demands existed for male and female librarians in the sample studied. Hornaday and Kuder concluded that although the same profiles or norms could be used in most cases, research was still needed to determine possible sex differences for specific occupations.

Additional Reference: Filbeck and Callis (1961).

Revisions in the Strong Vocational Interest Blank

Strong (1962, 1963) and Strong and others (1964) announced revisions in the men's form of the *SVIB* which had been necessitated by changes since 1938 in specific word meanings as well as in the nature of some occupations. The current form for men will contain 49 reworded items among the 298 which were retained from the old list of 400 items. Strong and others (1964) showed that as adequate a discrimination could be realized with fewer and also with unit-weighted items as could be obtained with variable weights and with many more items.

A recently constructed inventory, which includes 101 entirely new items, will be used to construct additional scales. Several research-based decisions concerning new scales included (a) use of item-retest data to exclude unstable items, (b) limitation of the number of scorable items for each scale to about 40, and (c) employment of unit rather than multiple-weight scoring. For example, when eight occupational keys were compared (Strong and others, 1964), no appreciable differences were found in (a) reliability, (b) accuracy of differentiation of an occupational group from a reference group, and (c) intercorrelations between scales based on unit-weighted and multiple-weighted methods of scoring. This move to unit weighting in item scoring contradicted Kuder's (1963) argument that improved computer and scoring technology reduces the advantage of simplicity. Kuder proposed that item weights be the simple difference in percentage by which two different groups answer items in a given way. The possible range of weights from +100 to −100 actually reduces to a far smaller range in practice. Kuder's data based on this method showed a high degree of differentiation. Since Kuder did not compare his results with unit-weighted scores based on the same data, one cannot be sure that the gain in discrimination was worthwhile.

The scheme proposed by Darley and Hagenah (1955) for judging intensity of interests in *SVIB* profiles was criticized by Stephenson (1961b) mostly for its subjectivity. The major result of the scheme has been the attainment of a lower degree of interjudge agreement than is desirable in profiles of ratings for the so-called primary, secondary, and reject patterns. In comparison with Darley and Hagenah's system, Stephenson proposed a somewhat more complex alternative scheme, which not only retained the essential features of the older system but also provided a special chart to simplify the actual ratings. He compared both rating methods against the same sample of profiles for college men and found his own method was the more reliable.

Korn and Parker (1962) proposed a simple method which should also be expected to yield reliable results. However, they did not directly compare their own approach with other methods relative to the same data. Norms for Stanford University students and for a sample of National Merit Scholarship applicants suggested that far fewer primary or reject patterns would result for Korn and Parker's method than for Darley and Hagenah's. Until some arbitrary agreement or objective standard can be derived, it will be difficult to evaluate these different methods.

A somewhat related feature in profiles for the *SVIB* also came under attack. Traditionally, shaded areas on the score sheets represented intervals within which scores should be interpreted as not significantly different from chance. Strong threw dice to define the average chance score one should expect to receive on each scale. Boundaries were set at plus and minus one standard deviation about these means. Stephenson's (1961a, 1962) data cast doubt on the traditional interpretation. So-called chance scores proved surprisingly stable on retest. Moreover, when college subjects were instructed to fake chance scores they could not. However, when they were asked to obtain higher or lower scores on specific scales than they earned under normal instructions, they could modify their scores. Campbell (1963) recommended defining the shaded areas in such a manner that they would represent insignificant deviations from the average scores for Strong's "men-in-general" group. An interval of plus or minus one standard deviation about the mean for "men-in-general" gave a broader range of scores than before. This procedure surely furnishes a meaning which is closer to what counselors can use and understand than that previously provided.

Response Set

Few psychologists take interest scores at face value. Among other possibilities, scores reflect a degree of response bias which may be deliberate or unconscious. Kirchner (1961) compared the *SVIB* scores of 156 applicants for retail and industrial sales positions with the scores for 117 men employed in these two positions for a minimum of five years. When compared with the employees, the applicants scored higher on social service and business detail scales and lower on sales, scientific, and technical scales. Although age differences between the samples were not given, the results strongly suggested a *liking* response set. This set could be the assumed safe way for an applicant to respond in such a real life situation.

Bridgman and Hollenbeck (1961) found that introductory psychology students increased their scores on both the Sanitary Supply Salesman and the Industrial Psychologist scales of the *Kuder Preference Record—Occu-*

pational, Form D, when these students were asked to simulate applicants for these positions or applicants for "a job in industry." These authors reasoned that special predictor scales for the situation in which applicants instead of "men-in-general" are used as a reference group would be helpful in industry. This conclusion was consistent with Kirchner's findings.

The tendency to respond *like* (*L*), *indifferent* (*I*), or *dislike* (*D*) to an exceptional degree on the *SVIB* was studied by Armatas and Collister (1962). Their sample from the University of Kansas comprised three groups of males who scored one standard deviation above the mean on the *L* or *I* or *D* response count but below the mean on both of the remaining counts. These subgroups did not differ in academic aptitude or skills in English usage, reading, and mathematics. Scores on the *Edwards Personal Preference Schedule* (*EPPS*), the *Sixteen Personality Factor Test*, and the Inventory of Beliefs were used to test hypotheses concerning personality differences among these groups. Among the many *t*-tests and other comparisons, the small number of significant differences which were in the predicted direction seemed sufficient to support the hypotheses. Generally, in comparison with individuals placing in the *D* and *I* categories of response, *L* respondents were more socially oriented, more flexible, and lower in academic achievement (grades). Relative to members falling in the *I* and *L* classifications, *D* respondents were more object oriented, more rigid, and lower in academic performance. In comparison with individuals in the *L* and *D* groups, *I* respondents were more intellectualistic, more aloof, and higher in academic achievement, especially in mathematics and science courses.

In his use of different personality measures, Brown (1963) reported a partial replication with 220 female nursing students. He found no correlation above 0.21 between *L* or *I* or *D* counts on the women's form of the *SVIB* and scores on scales from the *Minnesota Multiphasic Personality Inventory*, the *Guilford-Zimmerman Temperament Schedule*, and the *Kuder Preference Record—Vocational*. The *SVIB* profiles themselves seemed to be most heavily influenced by *D* responses, somewhat modified by *L* responses, and little affected by *I* responses. Brown concluded that his own findings as well as those of others showed that although there was a nonchance relationship between *L* or *I* or *D* modes of responding and measures of basic personality traits, the relationships were too low for practical use.

Construct Validation

Determining whether inventories reflect intrinsic or extrinsic interests and values poses challenging problems of definition and methodology. In a novel design, Miller (1962) compared interest and personality traits for three occupational groups that differed in work setting, in job function, or in both characteristics. His subjects were 50 YMCA boy workers, 50

YMCA business secretaries, and 50 controllers. Interest and personality traits were inferred from responses to selected items and to subscales of standardized instruments. Significant differences were found for the separate occupations but not for age levels within these occupations. With respect to differences associated with job setting or function, the results suggested that occupations do vary in terms of intrinsic and extrinsic value orientation.

In exploring the same problem that Miller pursued, Kinnane and Suziedelis (1962) compared scores on the *SVIB* and Super's Work Values Inventory for 191 college students. The latter inventory was revised to transform values into specific work concepts and to provide six independent scales. Subjects who scored in the top and bottom quarter of each value scale were compared for proportion of high scores on each of seven Strong interest groups. Relatively close agreement with expected interest patterns was found for intrinsic values, such as *heuristic-creative*. In the instance of extrinsic value scales, such as *work conditions and associates*, the extent of agreement was relatively low.

Suziedelis and Steimel (1963) investigated the possibility of a correlation of measures of interests with those of basic personality needs. Male college freshmen and sophomores took the *SVIB* and the *Edwards Personal Preference Schedule* (*EPPS*). The numbers of high scores—A's and B+'s—on each of seven *SVIB* interest areas were compared for students who stood high or low on each of the 15 need-scales of the *EPPS*. Standing *high* meant that a student earned his highest or second highest score on that given need-scale; standing *low* meant that he earned his lowest or second lowest score on that scale. The hypothesis that persons with given predominant needs will show characteristic vocational interests was partly supported. Some of the need-interest patterns fitted common expectations, although other patterns did not. For example, students who scored high in the scales of achievement or endurance of the *EPPS*, in comparison with those who did not score high, more frequently showed high standing in the area of biological and physical sciences of the *SVIB* and low standing in the area of sales of the *SVIB*. However, students placing high on the autonomy scale of the *EPPS*, in comparison with those students not placing high, more frequently scored high only in the literary or verbal expressive area of occupational interest in the *SVIB*.

Crites (1963) tested specific hypotheses concerning the motives which would predominate for given vocational interest groups. He gave the *SVIB* and a special battery of self-report measures of work motivation to 130 males in introductory psychology. The latter set of tests was based on factor analytic studies that had been aimed at providing clearly defined, independent measures for material security, job freedom, personal status, social service, behavior control, system, and structure. A correlation analysis produced both hits and misses, although the over-all results could be judged as satisfactory. Through use of analysis of variance, Crites compared mean motivation scores for subjects classified by degree of interest (*primary*, *secondary*, and *reject*) in each of the major Strong occupational areas. Except for some interaction effects, the results suggested that *kind* but not *degree* of motivation was related to given fields of interest.

Crites's data concerning job freedom can be compared with the previously cited data concerning the inferred need of autonomy in the study by Suziedelis and Steimel. For Crites, measures of job freedom correlated significantly (low positive) with average interest score in the biological and physical sciences and about zero with scores in the verbal expressive area. That different measures of the same motive construct failed to correlate with the same measures of interests brings to light the need for more adequate construct definitions and measures than are now available.

Additional References: Springob (1963); Super (1962).

Conclusion

Perhaps the most important developments of this review period were (a) the culmination of Clark's (1961) work with skilled-trade interests and (b) revisions in the *SVIB*. Purely psychometric matters such as item selection and weighting were handled most expertly, and the problem of coping with irrelevant response was given careful consideration.

Much remains to be done if one is to link interest scores to motivation, learning, or personality variables. Simply correlating current measures of interest with measures of what is inferred to be motivation or with other variables is an easy but often fruitless gesture. One can hardly expect to clarify the meaning of one construct by relating it to a second construct which is not adequately understood. More effort should be put into experiments in which learning or motivation processes are better controlled. Conditions to date still indicate that psychologists know much better how to apply the mechanics of psychometrics to the construction of interest tests than how to explain what they measure.

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CHAPTER VI

Trends in the Measurement of Personality

EUGENE L. GAIER and WILLIAM F. WHITE*

If the approach to the study of personality was once largely confined to the examination of isolated measurements from a limited number of tests *or* from tests employed with little apparent regard for theoretical implications obtained from college sophomores, then the research to be reviewed for the period from July 1961 to July 1964 revealed some interesting, probably desirable, albeit somewhat elusive changes. The following praiseworthy efforts were noted: (a) appraisal of other investigators' as well as of one's own data when the latter were being interpreted, (b) a trend toward framing new hypotheses about the results of a given investigation when these results served to test or to elaborate upon existing theories, and (c) the development of new theoretical formulations. However, from the statistically sophisticated studies concerned with personality to the more impressionistic surveys encountered in symposia papers, the studies during the last three years *in toto* reflected a picture of chaos, from which, however, there now seems to be more promise amid an increasing sophistication of more widely tested, perhaps even more generally acceptable, theories. A kind of anarchy has appeared to plague the literature in terms of an apparent lack of criteria that were generally acceptable even to investigators with seemingly comparable training, experience, and stated commitments.

The present chapter was organized around five major groupings of papers that were judged pertinent to personality measurement for the period covered. These groupings include method and design, personality and creativity, response set and social desirability, self-concept and body image, and anxiety.

Method and Design

Although empirical attempts to assess personality have provided no breakthroughs, they have led to a continuing development and refinement of techniques and instruments. One trend has been the extended interest in P-techniques and R-techniques that were facilitated and stimulated by the widespread use of computers and factor analytic methods. Another trend has been in the direction of the validation of long-established instruments with respect to external criteria. Noteworthy attempts were made to relate these tests and instruments to constructs, models, and theories.

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Hypothesis generation, based on factor analytic approaches as distinct from hypothesis testing, was evident in the field of personality assessment. This trend coincided with the expanding market of computers and with the extensive listings of available statistical programs. Criticizing current research in personality involving factor analytic approaches, Smedslund (1964) argued that too little concern for the psychological processes relating to item response culminated in only a resultant intuitive basis in the interpretation of scores. A substantial lack of objective and exact operational connections also resulted from the questionable labeling of factors.

Earlier, Cattell (1962b) asserted that any proper conceptualization of the relation of personality and role would be unattainable without one's grounding the discussion in general group theory. Accordingly, in a single theoretical model he posited 28 propositions defining a series of personality, role, and group concepts in group behavior which he believed to be mutually consistent. For Cattell, the concept of dimensions defining the parameters he envisioned were based on a factor analytic approach, although he was quick to add the qualification that this orientation did not constitute an indispensable restriction. Nevertheless, Cattell (1962a, b; 1963a, b; 1964) continued both to extend and to amplify his approach—an approach that has been dominated by his singlemindedness in demonstrating meaningful personality parameters via factor analytic techniques (Cattell, Knapp, and Scheier, 1961; Cattell and Tsujioka, 1964). In spite of the confusion caused by his esoteric vocabulary and in spite of a tendency to overinterpret factors based on unreliable measures, Cattell initiated lively controversy in a field too often preoccupied with the obvious.

On the other hand, Overall (1964) noted the lack of scientific status of factors and seriously questioned the relationship between factor analysis and primary dimensions of objects. In his illustrative example, neither the number nor the nature of primary factors had an inherent relationship to the true conceptual dimensions of the objects measured. From consideration of five analyses of objective personality data, Cattell, Knapp, and Scheier (1961) described second-order factors as contributing to the understanding of personality, although their predictive power was judged to be less than that of first-order factors. Cattell (1962a) not only defended the interpretation of rotated factors in oblique rather than in orthogonal form but also stressed the importance of the interpretation of factors as influencing agents upon which the variables in the study are dependent. Thus, during the period from 1961 to 1964, increased attention was directed toward the purposes of factor analysis, the explorations of problem areas, and the ways and means of interpreting factors.

Simulation of Personality

The advancement of computer technology has brought ever closer the potential that computer simulation may hold for personality theory. Perhaps there was no greater contribution of computer simulation to personality research than that of the simultaneous handling of vast amounts of data in a multivariate manner. Although fear had been expressed that the limitations of machines might bind and shape the limitless capacities of men, the optimism and heuristic value of the articles edited by Tomkins and Messick (1963) pointed out unique psychological contributions of computer simulation. The simulation studies on cognitive behavior by Abelson (1963) and on models of perception and language by Uhr (1963) should become creditable vehicles for expressing personality theories. If educators and psychologists are to be in tune with psychological theory, it will be necessary for them to be cognizant of the details of computer programming and to be prepared to program new systems.

Subjects and Experimenter

Perhaps because most of the researchers who publish in personality assessment and dynamics were academicians, freshmen and sophomores continued to be captive lots drawn for experimental study. Orne (1962) suggested that subjects formed their own hypotheses regarding the purpose of experiments and then responded to variables in a manner concomitant with their private hypotheses. The biased research resulting from personality characteristics of volunteers has usually limited the formation of valid generalizations to larger populations.

Since students in psychology classes are most often obliged to participate in varied research in order to gain course credit, the problem of bias in terms of those who keep their appointed times and tasks becomes important. Levitt, Lubin, and Brady (1962) demonstrated that studies using volunteers were contaminated by those who promised to participate but failed to appear for the experiment. Male "no-shows" were reported by Leipold and James (1962) to be more anxious and less in need of social approval than those who "showed"; female "no-shows" had a lower grade point average than female "shows."

The hierarchy of birth order became a debatable variable in the evaluation of the validity of sample selection. Glass and others (1963) concluded that first-borns did not react so strongly to frustration as did later-borns. They suggested that birth order be considered an ecological as well as a psychological variable in the interpretation of empirical findings. In contrasting late-borns to first-borns, Stotland and Cottrell (1962) concluded that late-born youth react more consistently to experimental manipulation.

Although the topic of experimenter bias and of the effect of the experimenter's personality and attitudes on the performance of subjects in personality ratings is somewhat taboo, two reports highlighted the problem of experimenter determinants. Among the many conclusions drawn from his studies, Rosenthal (1963) reported a non-chance relationship between the extent and tenacity with which the experimenter viewed his hypothesis and the response behavior produced by subjects in those tasks associated with that hypothesis and that specific experimenter. Early data returns were also found to influence the experimenter and to produce experimental bias. Rosenthal suggested that the chief source of the bias-producing agents was pre-experimental instruction and behavior which invoked some form of response set. In their study of the conditioning of hostile verbs, Sarason and Campbell (1962) reported a significant positive interaction effect between the general hostility test scores of both experimenter and subject.

Personality and Creativity

A major by-product of the findings reported on differences between intelligence per se and creativity has been an intensified effort to isolate and to identify personality facets identified with creative behavior.

Despite reservations expressed by de Mille and Merrifield (1962) regarding the adequacy of its methodology, the work of Getzels and Jackson (1962) may well have been a major impetus for the marked upsurge in research concerning creativity. The literature abounded with studies in which attempts were made to pinpoint the creative function in terms of four orientations: (a) the nature and quality of the product created, (b) the actual expression of creative acts and the continuing intellectual process during the creation, (c) the nature of the creator, and (d) environmental factors that fostered creativity. Although results of varying degrees of generalizability and validity were reported—and the debate on whether the creative process was really different from other problem-solving processes was extended and intensified—a singular lack of empirical research grounded in personality theory, as such, was observed.

In his study of National Merit Scholarship recipients, Holland (1961), who used a measure of risk-taking tendencies, reported that creative performance among high school students occurred more frequently among those who were independent, expressive, asocial, consciously original, and inclined to have high aspirations for future achievement than among those who exhibited qualities essentially opposite to those enumerated.

The work of Barron (1962, 1963) provided data on measures of personality and creativity. From a group of professional and student writers, Barron (1962) found distinguished writers to be particularly high on the scales of the *Minnesota Multiphasic Personality Inventory* (*MMPI*) associated with schizoid, depressive, hysterical, psychopathic, and femininity predispositions. On the scales of a test developed around Jungian typology, the distinguished writers were distinctly more introverted than extroverted, more dependent on feeling than on thinking, and more intuitive than sense-experience oriented. As a group, these writers were unusually high in conceptual and verbal intelligence. What may be most significant for personality theory is that having an IQ above 120 appears to be but a negligible factor in creativity. From motivational and stylistic variables emerged the primary determinants of creativity—results in accord not only with Torrance's (1964) latest *rapprochement* of his earlier studies but also with Burkhart's (1962) findings that creative students in art scored high on measures of four dimensions of personality creativity: (a) spontaneous abstract orientation, (b) divergent power, (c) ideational and perceptual openness, and (d) social self-determination.

Also relevant were the observations of Selye (1964), who delimited 16 personality types among creative scientists, such as fact collector, gadgeteer, bookworm, and classifier. Although the reviewer does not wish to propose that making lists will provide all the answers, this array might provide a springboard which could even catapult creativity theory into not only a less dehumanized but also an appropriately more complex set of answers to many current questions.

Investigations of scales designed to assess personality and originality continued to point up that the validity of the scales of personality inventories such as the *California Personality Inventory* (*CPI*) and the *Sixteen Personality Factor Questionnaire* is generally low, even in the face of considerable variation among studies by Holland (1961) and Smith and others (1961). Validity coefficients of nonintellective scales intended to assess originality were also low, although a wide range of correlational values was reported.

In general, biographical items and measures of past achievement appeared to be the most valid and efficient predictors of creativity, followed by self-ratings and direct expressions of goals and aspirations. Originality and personality inventories ran what Taylor (1964) called "a poor third." Traditional aptitude and general intelligence measures ranked even below personality inventories.

Some of the most provocative data associated with new types of measures and approaches continued to emerge from reports made at the University of Utah conferences on the identification of creative scientific talent (Taylor and Barron, 1963).

Perhaps creativity is too complex and elusive to be probed effectively in laboratory isolation. What the current data from many studies did suggest was that the person who is creative is simultaneously tough-minded and flexible enough to cope with environmental stimuli in a novel yet acceptable fashion.

Response Set and/or Social Desirability

The spate of investigations reported on the concept of response set during the past three years (Dahlstrom, 1962; Gibson, 1962; McGee, 1962a, b; Marlowe, 1962) continued to leave the major question in this area still unresolved: When is response set reflecting responses to the individual *items* rather than reactions to *content?* In fact, when the initial studies of response set appeared, investigators were quick to sound the tocsin heralding a revolution in personality measurement. Instead, what seems to have emerged is the sound of civil war among investigators.

Social Desirability

Interpreting high scores on a scale of social desirability to be indicative of the need for social approval, Marlowe and Crowne (1961) found that subjects who scored above the median compared to those below the median expressed significantly more favorable attitudes in response to questions about a tedious spool-packing task. Jackson and Pacine (1961) reported consistently low and generally nonsignificant coefficients of correlation between sex membership and the rated desirability of Gough's *CPI* items. In comparison with males, females choose relatively more of the desirable items.

In the factor analysis of a matrix composed of a particularly broad sampling of 61 personality scales—*MMPI* scales and three other personality scales—Edwards, Diers, and Walker (1962) interpreted the first rotated factor as the tendency for one to give socially desirable responses and the second factor as the tendency for one to provide acquiescent responses. A third factor was tentatively identified as the inclination to falsify answers to personality items. A later factor study by Edwards and Walsh (1964) yielded six factors, with social desirability as the first factor.

Utilizing 10 aggressive statements written in seven different styles, Goldfried and McKenzie (1962) investigated the differential effect of item style on social desirability and on frequency of endorsement for males and females. Although both social desirability and frequency of endorsement were found to be influenced by item style, the influence differed for the two sexes in the case of frequency of endorsement but not in the case of social desirability of ratings.

Barthel and Crowne (1962) confirmed the hypothesis that when approval-motivated subjects employed the social desirability categorization displaying the greatest taboo-neutral word discrepancy scores and when approval-oriented subjects adopted a perceptual speed set toward the experiment, minimal discrepancies were obtained. The investigators interpreted their data to imply that a major component of variance in personality defense studies was contributed by the conscious inhibition of responses. In a related study, Dicken (1963) employed measures of good impression, social desirability, and acquiescence as suppressor variables with nine personality scales of the *CPI*. Nine corresponding behavior ratings were used as criteria in one or more of six independent samples. When variance in the measures of good impression and desirability was accounted for, significant gains in validity were rare, and no gain in validity resulted from suppression of acquiescence. Existing methods of correcting for response set variance in personality scales did not appear to be practical. In Dicken's estimation, the importance of social desirability and acquiescence in questionnaire personality assessment may have been vastly overemphasized.

When an instrument titled Survey of Interpersonal Values was administered under normal instructions and later under faking instructions (Braun, 1963), scores increased on measures of conformity and leadership, but decreased on measures of support and independence. Employing a sample of 65 college students and 105 male psychiatric patients, Boe and Kogan (1964) utilized a revised check list of items concerned with interpersonal values and proceeded to relate scores on seven measures of social desirability obtained from the check list to several scales of the *MMPI*. Although scores on scales of social desirability that were derived from the check list served to point out fakers of social desirability among both college students and psychiatric patients, social desirability scores based only on the tendency to endorse socially approved items exhibited a low correlation with measures of social desirability on the *MMPI*. However, various scores in social desirability based upon all the items in the check list were highly correlated.

In addition to the studies that were aimed toward broadening the theoretical base of personality assessment, many investigations were specifically concerned with the search for meaningful relationships among social desirability and varied facets of personality (Jackson and Messick, 1962; Mahler, 1962).

Acquiescence

Langer (1962) addressed himself to the question of determining whether a meaningful relationship existed between response sets associated with acquiescence and social desirability dimensions as manifested both in Gough's *Adjective Checklist* and in the *W* and *Dd* responses on the *Structured-Objective Rorschach Test* (*SORT*). On the basis of responses to Gough's instrument, Langer divided his subjects into *agree* and *disagree* groups, which were further subdivided on the basis of sex. The *SORT* was subsequently administered. A relationship between acquiescence and social desirability response sets was partially confirmed, in view of the fact that the male *disagree* group exhibited a significant rank order correlation between the *disagree* dimension and *Dd* responses, whereas the female *disagree* group yielded a significant rho value between *disagree* set and *W* responses. The commonality underlying the set phenomena was hypothesized in part to be attributable to the interaction of cognitive style with test variables.

Of particular relevance to the matter of acquiescence and/or social desirability were Wiggins' (1962, 1963) attempts to differentiate among strategic, method, and stylistic sources of variance in the *MMPI*. For Wiggins, strategic variance occurred when scales were used to discriminate between criterion groups and a normative population. Method variance, which was obtained through use of keying categories such as *true* and *false*, was also affected by the relative proportion of items in each category as well as by the relative item popularity. Stylistic variance referred to subjects' characteristic response styles, such as acquiescence-defensiveness—styles which are relatively independent of the intended measurable function underlying the test itself. In a factor analysis of seven social desirability scales and six acquiescence scales, the social desirability scales clustered in one quadrant, whereas the six measures of acquiescence were found in another.

Attitude Scales

In his attempt to answer the question concerning what attitude scales measure, Taylor (1961b) reported average interquartile ranges of item ratings for social desirability to be about three scale positions out of nine. Data were presented to show that correlations between scores on attitude scales and responses to items of a personality scale which were used as a basis for reporting a general response tendency were not explainable in terms of reference to a general acquiescence set. His findings on "yea-sayers" were also relevant (Taylor, 1961a). Similarly, to identify the concept of social desirability, Bell (1962) suggested that the elevation component of an individual's personality inventory profile might represent acquiescence or social desirability, whereas scatter might simply reflect deviant response set.

Personal Needs

Garrison and Scott (1962) noted that specific personal needs of prospective women teachers varied significantly according to selected personal characteristics. They reported that 14 of 15 measurable psychological needs from the *Edwards Personal Preference Schedule* (*EPPS*) varied according to one or more personal characteristics of the subject, including marital status, age, college class standing, number of siblings, order of birth in family, educational level of mother and father, and occupation of father.

Methodology

In his investigation with subjects in Western Australia who were instructed to answer questions on the *MMPI* as though the responses reflected their "ideal selves" as significantly more extroverted, Star (1962) found that the subjects had scores which suggested that they were less neurotic and less variable than subjects who took the instruments under regular instructions. Star concluded not only that the *MMPI* scales were highly vulnerable to response set but also that the direction and extent of distortion might differ from one population to another. Orne (1962) firmly cautioned his readers that the subject must be recognized as an active participant in any experiment and that it may be quite fruitful to view the psychological experiment as a very special form of social interaction. He proposed that the subject's behavior in the experimental setting is a function of the total situation encompassing experimental variables.

After identifying six kinds of deviant response tendencies, Sechrest and Jackson (1963) took the position that deviant responses cannot be treated in one specific way; the investigator must take into account the variety of ways people respond in a digressing fashion.

Self-Concept and Body Image

In the attempt to isolate and to quantify the individual's concept of the self, a number of investigators appeared to augment the number of methodologies employed. Wylie (1961) presented a comprehensive review of instruments used prior to 1961 to assess the self. In this critical survey of the research, Wylie concluded that four key flaws had plagued exploration in this field: (a) the existing theories were vague, incomplete, and lacking in extensive empirical support; (b) the total accumulation of substantive studies was inadequate, inconclusive, and singularly disappointing, especially in view of the amount of effort expended in investigation of the self; (c) the existing theories—such as they were—were unable to account for behaviors observed, particularly in the context of the school of the everyday world; and (d) a most immediate need existed for the introduction of multivariate studies that would allow investigators to resolve systematically instead of haphazardly many contradictions associated with the possible interaction of variables. Three years later, these same criticisms remain valid and unanswered. One can only hope that the serious investigator in this area will review Wylie's work and will undertake appropriate studies.

Self-Concept

While studies on the self continued to suffer because of their lack of generalizability, a basic question was raised concerning the nature of the study of the self. Combs, Soper, and Courson (1963) boldly asserted that confusion exists in the research literature on the self-concept because researchers accept the self-report. The typical studies were based on various forms of self-report inventories. Moreover, with semisophisticated subjects, considerable room existed for malingering in the instruments used. These authors reported low correlations between scores on self-reports and ratings of sixth grade children by teachers who had observed the children in three situations. Perhaps, as an anticlimax, these investigators were cautious to conclude that although the self-concept and the self-report are related, the interchangeable use of the two terms is unjustified.

Relevant to these findings is the investigation of Field, Kehas, and Tiedeman (1963) of the self-concept in career development. They theorized that translating the self-concept into vocational terms is something that occurs neither on one occasion nor with any degree of finality. Rather, it is a developmental process with respect to which the individual may fluctuate in his choices because of maturational or situational changes. In fact, they were severely critical of the Q-sort techniques' (Block, 1961) failure to take into account the need for the person to see himself in a given step of a continuing process; in this method of self-rating, the person sees himself merely as a product.

Mueller (1963) reported that when he acted as judge in rating others, the insight of the judges into himself was related to success in establishing insight into other subjects. The ability to predict and the ability to describe accurately were related, although it was less difficult for his subjects to predict than to describe. This finding might suggest that students who can set and accept their own self-concepts in contrast to those who cannot may be more successful in seeing how others react and how others view themselves.

Body Image

The concept of the body as a protective enclosure or container for the ego has stimulated much empirical investigation since the initial theoretical formulation introduced by Fisher and Cleveland (1958). They speculated that since body references were especially noted in the fantasies of their subjects and since the obtained protocols contained unusual numbers of unique responses on the Rorschach test, these responses were in some way related to the manner in which the subjects perceived their bodies.

In the face of numerous contradictory studies questioning the Fisher-Cleveland scoring scheme, Daston and McConnell (1962) concluded that the system was sufficiently objective and stable under the conditions employed by them to be of value in assessing effects of various treatment conditions of body image.

Since 1958 a number of measures have been employed: *The Drawing-Completion Test*, the Rorschach barrier score, and the *Thematic Apperception Test (TAT)*. The Rorschach penetration scores continued to be the most popularly employed measures of the body image indexes.

During the past three years, the role of body image in the organization of personality has received creditable attention. In a comparison of somatic and psychological assessments among hospitalized and nonhospitalized subjects, Jaskar and Reed (1963) did not find a significant correlation among the various projective measures of body image. Moreover, it was not particularly surprising that nonhospitalized subjects did express greater satisfaction with their body parts and body functions on a verbal self-report inventory than did hospitalized subjects. In a general conclusion, Centers and Centers (1963) noted that amputee children represented their bodies and those of others realistically and nondefensively in a Draw-a-Person test. These children either omitted amputated bodily parts or included a prosthetic device in the projection of their own images.

Probing the relationship between body image and small-group behavior, Cleveland and Morton (1962) administered ink blot tests and sociometric questionnaires to subjects at three separate human relations laboratories. High barrier score participants (i.e., those considered to be well integrated in body image) did receive significantly more votes for being influential, independent, active, and goal striving than did those subjects with low barrier scores (i.e., individuals judged to have a diffuse body image). The relatively low barrier scores of the latter group were viewed as indicative of private, selfish interests.

Concentrating on children, Rowe and Caldwell (1963) presented results that 70 percent of a sample of Negro adolescent delinquents ranging from 12.6 to 15.6 years underestimated their body size. The authors suggested that there may be a "time lag" between the body image and phases of somatic development. In an investigation concerned with white male children ranging in age from 7 to 14, Adams and Caldwell (1963) found that 60 percent of their normal sample and 53 percent of their disturbed group selected a larger figure. However, only 30 percent of the retarded children drew such figures.

Anxiety

Although investigations in anxiety continued to play a role of primacy in the hierarchical importance of research journals, a trend appeared to be directed toward the development of measures of *anxieties* instead of toward the pursuit of a singular trait dimension of *anxiety*. The consideration of anxiety as a multidimensional variate rather than as a unidimensional characteristic added serious semantic difficulty. In an exhaustive review of the study of anxiety in children, Ruebush (1963) pinpointed the current dilemma in which comparability of findings from different investigations is complicated not only by differences in theoretical definitions and orientation but also by variations in operational criteria of several studies that have been anchored to a comparable theoretical framework. Ruebush observed that, although there was agreement that anxiety produced some states of unpleasantness, the common denominator toward anxiety ended with these states of unpleasantness. Perhaps, as Ruebush speculated, an investigator can run the complicated maze of the many and varied anxiety studies through his categorizing past experimental trials of anxious subjects under headings of related experimental variables.

Situational Variables

Alexander and Husek (1962) reported research efforts that were focused on the development and cross validation of a measuring instrument for situational anxiety. Comparing anxious and nonanxious subjects on six exploratory anxiety scales, they presented partial evidence for the validity of the scales. The reliability of the scales was indicated from the results of cross validating and refining the scales of the Anxiety Differential test. Husek and Alexander (1963) also concluded that the Anxiety Differential test was reliable and sensitive. Data from experiments by Harleston (1962) revealed that anxiety level depends for its effect on task and situational factors as well as on the sex of the subject.

Two empirical studies concerned with anxiety in the school setting were noted. Scarborough, Hindsman, and Hanna (1961) concluded that anxiety made a difference in children's reading and language achievement when both intelligence and sex were controlled. Pringle and Cox (1963) administered Sarason's Test Anxiety Scale and General Anxiety Scale and reported, contrary to traditional thinking, that children in ungraded, child-centered, progressive schools received higher mean scores on both anxiety scales than did children in graded, adult-directed, traditional schools.

Winkel and Sarason (1964) attempted to assess the extent to which the experimenter variable actually became a confounding experimental factor. In a verbal learning situation with a strong experimenter-subject interpersonal component, three organismic variables—test anxiety of subjects, experimenters, and sex of subject—were manipulated. High test-anxious subjects did perform more adequately at lower levels of interpersonal involvement than did low test-anxious subjects; females performed best when run by low test-anxious experimenters.

Need Achievement

Following the initial work of McClelland (1953) and Atkinson (1958) on need achievement, several investigators dealt with need achievement in relationship to a host of other behaviors, such as conformity, risk taking, problem solving, vocal sounds, and scholastic performance. Because of the many variables believed to be related to the achievement motive, Moss and Kagan (1961) emphatically stated that since the term *need achievement* was too broad, greater usefulness might be obtained by replacing this concept with variables related to specific behaviors.

Although systematic investigation on achievement motivation has been limited, disjointed, and scattered, the studies reviewed by Crandall (1963) contained moderate but statistically significant consistencies across situations as well as over the maturing years of children.

Questioning whether the achievement motive exerts any influence on response learning under conditions of variable reinforcement, Burdick (1964) concluded that the schedule of reinforced responses and the need for achievement as measured did affect scores in a simple discrimination learning task. The arousal had the greatest impact on subjects with a low level of achievement.

Applying a survey method in the analysis of the high need for achievement with a northern Negro urban sample, Nuttall (1964) obtained positive correlations between a measure of need achievement and authoritarian child rearing attitudes. Northern Negro men, high on a measure of need achievement, appeared to reject religious feelings, to feel victimized by racial discrimination, and to be racially more aggressive than Negroes low on the same measure. Negro women reared in the North and standing high on a measure of need achievement tended to join organizations such as the National Association for the Advancement of Colored People (NAACP) and the Congress of Racial Equality (CORE) more frequently than did women placing low on the same measure.

Studies attempting to relate need achievement to academic performance have shown contradictory results, as exemplified by the investigations of Cole and others (1962), Rosen (1956), and Veroff and others (1960).

Personality Variables

Making use of measures of need achievement derived from the *TAT* and of scores on the Mandler-Sarason Text Anxiety Questionnaire, Feather (1961) compared groups of subjects who were formed from various permutations of their being above or below the median on each of the two scales. It was noted that for subjects who were judged to be high in need achievement but low in anxiety there was a positive relationship between persistence level and ease of the task. In other words, the longer the subjects in this sample persisted, the easier the task. For those individuals who were considered to be low in need achievement but high in anxiety, there was a positive relationship between persistence level and degree of difficulty of the task. In other words, individuals in this group exhibited greater perseverance as the task was reported to increase in difficulty level.

Concerned with daydreaming in class, Singer and Rowe (1962) examined graduate students in education and found partial support that frequency of daydreaming was positively associated with a general measure of anxiety. Frequency of daydreaming and total score on Cattell's *IPAT Anxiety Scale* were positively correlated and significant.

Attempting to interpret a new index of psychological achievement for men and women from the *CPI*, Gough (1964) stressed that the need for achievement is not derived from inner weakness, neurotic striving, or lack of ego strength. Rather, he interpreted it as an expression of psychological health.

Four other studies concerned with the relationship of anxiety measures to personality variables were noteworthy. Meyers and Hohle (1962) failed to find significance in the relation of anxiety indexes to measures of conformity and confidence among unselected college students. From a sample of mildly retarded male youth, Matthews and Levy (1961) concluded that the scores of retardates on the Children's Form of the Manifest Anxiety Scale (CMAS) were strongly influenced by response sets as well as by situational and capacity variables. The CMAS was considered inappropriate for a retarded, institutionalized population. Mogar (1962) failed to find significance between 12 presumed indicators of anxiety on the Draw-a-Person test and an external criterion represented by scores on a scale of manifest anxiety for a sample of psychiatric patients. Replication of a study in which both size of figure and its placement were correlated with scores on a scale of manifest anxiety among females also failed to yield significance. Having administered a forced choice scale of anxiety and social desirability items to undergraduates, Bergs and Martin (1961) found nonsignificant but positive correlations ranging from 0.10 to 0.42 between low scores on social desirability and an anxiety index.

Outlook

In many of the investigations of personality measurement which have been reviewed, recommendations were made for completion of additional research. The reviewers suggest that it is not so much additional research as *integrative* research that is now needed. Indeed, it seems time to talk less of statistical significance per se and more of the relationships of statistically significant findings to (a) assumptions underlying the research, (b) theoretical implications of the results, and (c) their consistency with those of other investigators. Too often, in the materials that have been reviewed, logical significance was lost in statistical significance. An almost frantic quality pervaded sometimes prematurely reported or not quite concluded studies.

The widespread use of correlational designs continued. Considerable emphasis was placed on establishing relationships between two response variables. Such variables only approximated measurements of personality parameters which conceivably were outside a research setting.

Computers have become a mixed blessing. Although their use in appropriately designed research has obvious advantages, their disadvantages, albeit not intrinsic, emerge in the hands of certain investigators. For some workers, the availability of a computer seems to heighten to almost orgiastic proportions the impulse to design research that is oriented toward the minute statistical analysis of data at the expense of substantive and theoretical considerations. Perhaps this sort of reaction is to be expected, to some extent, as statisticians and computer specialists continue to develop and to refine a relatively new technology.

Relative to quantitative methods in education, two questions may be posed: Beyond the simple mastery of statistics or the cooperation with statisticians, should not educational researchers orient themselves to an investigative context containing meaningful, preliminary questions that they try to answer after data have been collected and statistically analyzed? Although room must always be made for the devising and checking of new personality tests, should so many investigators be giving such a high proportion of their effort to this objective? Perhaps, in spirit, psychology too should be more imaginative. Otherwise, like pop art, it might well deserve the comment which occurs to one in *that* context: How many cans of Campbell's soup should one paint?

The singular lack of attention to personality dynamics was a substantial deficit in the research reviewed. Perhaps psychological investigators still operate within a professional lag which makes them fear that, unless they restrict themselves to quite superficial matters or otherwise useful behavioral terminology, they will be accused of the black magic once associated with the early "dynamic" psychologists. And yet, psychologists surely have the obligation, far short of witchcraft, to carry scientific explanations, or at least descriptions and speculations, into levels deeper than those found in behavioral terminology.

With respect to personality research in relation to education, it is disappointing that so much information that has been enthusiastically and expensively gathered has resulted in relatively little that is interpreted, or interpretable, in a practical manner. To some extent, substantial gains must await progress in personality theory. Nevertheless, during the planning stages in research some cognizance of people as people would surely bring forth products which more often have a perceptible connection with the classroom or even with the extra-school world than those which most current research furnishes.

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CHAPTER VII

Statistical Trends Relevant to Measurement

SAMUEL T. MAYO

The methodological pattern which Michael set in the REVIEW issues of February 1956 and February 1959 and which Schrader continued in the February 1962 issue has been followed in this chapter. No attempt was made to review factor analysis, computer applications, or psychophysics, since these topics were covered, respectively, in separate chapters of the December 1963 REVIEW by Merrifield and Cliff, Baker, and Schiffman and Messick. In addition, Tucker's (1963) chapter in the *Annual Review of Psychology* was concerned in part with these same three areas.

Relevant to the content of this chapter was the publication of Ghiselli's (1964) concise textbook, *Theory of Psychological Measurement*, which was devoted to a few selected topics in advanced measurement theory. Since the volume appeared too recently for reviews to be available, one cannot judge its possible impact on the profession. It would seem, nevertheless, to be an up-to-date supplement to Gulliksen's (1950) *Theory of Mental Tests*, although it appears to be somewhat less technical than Gulliksen's contribution. There have been altogether too few new books published in advanced measurement which have elucidated the highly subtle and sophisticated statistical developments of recent years in psychological measurement.

Significant references found during the period reviewed were primarily concerned with the following emphases: (a) critiques of previous technology, (b) refinements in existing technology, (c) expositions of newer technology, or (d) exhortations toward needed research. Previous work in configural scoring, linkage analysis, scalogram analysis, item discrimination indexes, moderator variables, and equating of test scores, to mention a few topics, was continued on both theoretical and empirical bases.

Item Analysis

During the past three years there has been not only the development of some new indexes of item characteristics but also the preparation of critical and expository papers on existing techniques.

Psychological Considerations

Recent criticisms have been made regarding the overemphasis upon test development relative to the use of empirical criteria at the exclusion of consideration of psychological theory as a basis for the explanation of the empirical relationships. One recent example of such criticism was that by Smedslund (1964, p. 252). Campbell (1961) criticized the psychologically unsatisfactory nature of the percentage of individuals passing an item as an index of its difficulty. Campbell felt that it was necessary to know not only *how many* subjects pass an item but also *why* they pass. There was the rather pronounced implication that the aspects of complexity, abstractness, and novelty of item content are able to markedly affect item difficulty. This type of difficulty is called *intrinsic*. Although test constructors should have reacted to the challenge afforded by Campbell's argument, they have neither devoted systematic attention to it nor given a precise statement of the manner in which the three aspects might be manipulated in order to change item difficulty.

In his empirical study, Campbell used for his test content geometrical figures, which were to be classified. Perhaps the main result of the study was the finding that the crucial determinant of the intrinsic difficulty was the qualitative nature of the classifying property. The author felt that although some light has been shed upon the nature of the psychological determinants of item difficulty, more questions had been raised than had been answered. Thus, the field remains open for extensive future investigation.

Myers (1962) explored the relationship between item difficulty and both the validity and reliability of a test. By way of introduction, Myers pointed out what appears to have been a cultural lag in the practice of test construction. In spite of general agreement among test theorists that, for maximum reliability, tests should be homogeneous in item difficulty, those who produce standardized tests continue to believe that items selected for a test should represent a wide range in difficulty. There seemed to be several rationalizations for this contradiction between theory and practice. Whereas the theorists are concerned with difficulty primarily in a statistical sense—that is, with the percentage of individuals in a sample who answer an item correctly—the test constructors are concerned with difficulty in a psychological sense, as it affects the morale or behavior of the test taker. Although it seems reasonable to assume that these two concepts of difficulty are imperfectly correlated, it is not easy to determine what makes an item difficult. One can understand the reluctance to change a practice that has been considered adequate.

Myers' study was addressed to the problem of whether in a practical situation a selected set of items of average difficulty would be more reliable and more valid than would be a selected set of items half of which were considerably more difficult and half of which were considerably easier than the average level of difficulty. He failed to find any difference in validity between tests with peaked and U-shaped distributions of item difficulty, although the tests with peaked distributions tended to be more reliable. Myers further concluded that more needs to be known about what makes an item difficult.

Hawes and Helmstadter (1963) set forth another kind of criticism of the traditional measurement of item difficulty, in terms of the percentage of examinees in a group answering correctly. These authors felt that the major limitation to the use of such a percentage is that it does not reveal psychological differences among individuals which exist relative to the determination of the degree of difficulty for each single item. It is possible to have items with identical indexes of difficulty which psychologically are not of the same difficulty. In spite of this limitation, no one seems to have suggested any alternative ways of determining item difficulty. Hawes and Helmstadter attempted to devise a new measure of item difficulty in which the response of each individual to each item was considered. Results indicated that the method of counting the number of responses that were required to obtain the correct answer did provide a useful index for obtaining the difficulty for an individual. However, for practical purposes in test development, it would make little difference whether the new or traditional index were used.

Item Selection

Bridgman (1964) investigated the relation between bivariate normal correlation and the upper-lower discrimination index (D) for various combinations of criterion group sizes and item difficulties. He found that, for any given combination within the parameter ranges studied, the relation between D and r is very nearly linear. For 27-percent criterion groups and for 50-percent level of item difficulty, D is nearly equal to r. The slope of the line for the regression of D on r decreases as level of item difficulty decreases or increases. Applicability of these relations to actual item analysis data is limited by the assumption of a bivariate normal distribution.

Lingoes (1963) attempted to meet some of the criticisms which have been directed against the scaling techniques of Guttman, among which have been (a) lack of a clear meaning for his important concept of a universe of content and (b) unsatisfactory measurement of reproducibility. Lingoes maintained that his is a completely objective and empirical procedure for selecting dichotomous items which meet the Guttman scaling criteria. In his conclusion, Lingoes indicated that his method, which is more objective than is scalogram analysis, can be used wherever the latter is applicable.

Wohlwill (1963) explored the potentialities not only of applying the noncumulative, or point, model to psychological data but also of developing satisfactory measures of scalability for noncumulative items. In the model proposed, the subject responds to only those items lying at or close to his own position on the scale. Although this model seems to have a great potential for measurement in any preferential choice situation (such as those involving attitudes, interests, aesthetic judgments, food preferences, and some in developmental psychology), the problem of the measurement of scalability remains to be solved. Extension of procedures developed for the cumulative model to the point model is by no means so straightforward as it might appear.

Baker (1964) studied the question of how the interpretation of test scores is affected by the units of measurement which represent different amounts of the variable measured at different points on the score scale. Although this inequality of units raises some difficult statistical questions, Baker deferred consideration of them in order to concentrate upon implications for the test constructor and test consumer. The consumer has two paths open to him: (a) to treat naïvely all test scores as a nice interval scale or (b) to try to take into account the variations in test score units. Baker felt that the fundamental concept in item analysis is the *item characteristic curve*, a smooth curve fitted to the proportion of persons at each criterion score level who make the particular response being studied. The item characteristic curve does provide much more information on the characteristics of an item than does either the difficulty index or the item validity index. Furthermore, it provides the means to visualize easily the properties of an item and to specify them in precise mathematical terms. Although the alternative approach described offers no quick solution to the consumer, it was felt that the application of the approach might eventually help to eliminate the unequal interval problem.

Ray, Hundleby, and Goldstein (1962) discussed the relation of item parameters to test skewness and kurtosis. Both were shown to depend upon item means, variances, and covariances. The trivariance and quadrivariance types of product-moment correlation coefficients were also considered as indicators of test parameters. Empirical data were also given.

Correction of Item-Total Score Coefficients for Relevant Item Inclusion

The correction of item-total biserial correlations for relevant item inclusion was treated in two articles. Since previously developed indexes concerned with the correction appeared to be questionable, each of the present articles represented an attempt to devise satisfactory indexes. Howard and Forehand (1962) pointed out that although the correction is probably not necessary for deciding between items involved in the process of measurement on a single scale, uncorrected formulas are not applicable to the problem of discriminant item analyses. In the latter case, in which a test is constructed to measure two or more traits, one could compare the correlations of items with the total score of the scale in which they are included and with the total scores of the other scales. Such comparisons are difficult because of the spurious inflation resulting from inclusion of the relevant item. Two formulas for the corrected coefficient were given. One was called an *exact* formula; the other, an *approximation* to the exact formula. The approximation is a lower bound for the corrected coefficient under certain specified conditions. Howard and Forehand suggested that the approximate formula could serve as a short cut.

Henrysson (1963) developed a corrected formula, with the same numerator as in certain well-known existing formulas but a different denominator. The denominators represent different estimates of the standard deviation of the test containing the $n-1$ items that remain when any one item is excluded. However, Henrysson's biserial item-remainder coefficient still suffers from the difficulty that the biserial coefficients are unduly influenced by unique parts of the item variances. He developed a second formula, the biserial correlation coefficient corrected for unique variance. For an empirical demonstration which was undertaken for a comparison of the various coefficients, Henrysson obtained values by the new item-remainder formula that were identical to those calculated from the raw data. The relevant item was removed each time so that the total score could be obtained. Values of the coefficients corrected for the influence of unique item variances are between those of the noncorrected coefficients and the item-remainder coefficients.

Special Approaches

Gruber and Weitman (1962) considered a problem for the theory of item analysis in longitudinal experimental studies. In this context it is desirable to construct tests that will be maximally sensitive to change in ability. For example, if the ability of the population changes, items having maximal discriminative power in a pretest will be reduced in discriminative power in a posttest. Results suggested that item selection can be improved when account is taken of the direction of change in ability within the population tested.

McQuitty (1961) described a method for applying a usual type of item analysis to the selection of configurally significant items. He further showed how these items could be treated in either a summative fashion or a pattern score so that differentiation between groups could be realized.

Additional References: Michael and others (1962); Tupes (1963).

Reliability

Myers (1961) described a relationship between the variance-covariance matrix of test items and the concept of the standard length of a test. The standard length had been defined as the set of N items needed for a reliability of 0.50. Myers also described an index of item-test relationship in standard length terms and showed that the sum of these indexes for the items in a test is equal to the square of Jackson's coefficient of sensitivity.

Cronbach and Azuma (1962) empirically compared several internal-consistency coefficients in terms of how well they serve various purposes.

The study was a by-product of previous attempts to reformulate the foundations of reliability theory and to offer an improved interpretation of coefficients. Tests were derived from a pool of dichotomous items, the content of which was not described although the statistical characteristics were stated. The results suggested that, for hypothetically random parallel tests, certain of the coefficients are more appropriate than others under variously specified conditions of mean item intercorrelation.

In his use of a relatively homogeneous scale of 48 items intended to measure academic self-concept, Payne (1963) compared five frequently employed internal-consistency estimates of reliability with respect to six variations in skewness of criterion score distributions for different samples. Results indicated a high degree of similarity among the several estimates both within and across samples. The author further concluded that it made little difference which estimate of internal consistency was used.

Webster (1962) devised a reliability coefficient of the ordering that is achieved by test scores. The coefficient, which is simple to calculate, is practically insensitive to skewness. Furthermore, as skewness in total test scores decreases, the coefficient closely approaches in value, depending upon the item scoring convention employed, the estimate furnished by Kuder-Richardson Formula 21 or a previously generalized estimate given for Kuder-Richardson Formula 21. It seems to be applicable for certain item selection procedures for which long initial tests and numerous potential test items are available.

Norms

In an exploratory study, Ebel (1961) compared three methods of equating scores on two tests: (a) adjusted linear equating, (b) equipercentile equating, and (c) adjusted equipercentile equating methods. The tests used were two forms made up from mathematics items. The methods were found to be almost equal in accuracy. On the basis of experience in this study, it was planned to develop a more precise and reliable empirical comparison of various methods.

Lord (1962b) proposed a solution to the practical problem of obtaining representative national norms for school achievement tests through sampling in order that improvements in the cooperative efforts of schools in the norming operation might be realized. Specifically, he raised the question concerning whether the performance of a large group on a long test could be estimated through the administration of only a few items to each student. The results suggested that in some cases it may be better to sample items than examinees. This study was limited in that items were sampled without replacement. The plan could be improved if samples of items were taken without replacement, while at the same time additional item samples were drawn so that each item would appear in several different short tests. The obvious problem of the optimum number of items and examinees to use for a particular norming job could not be solved in this study. Further research will be necessary in which evaluation can be made of the various possibilities of trading items for people in a wide variety of situations.

A symposium chaired by Wesman (1962) featured papers on three types of standard scores for aptitude and achievement tests: (a) normative standard scores described by Gardner (1962), (b) content standard test scores detailed by Ebel (1962), and (c) scales with nonmeaningful origins and units of measurement reported by Angoff (1962). Flanagan's (1962) evaluative discussion served to synthesize much of the material presented and to relate the importance of content scores to the development of norms for achievement tests in Project Talent.

Prediction and Classification

Hazewinkel (1962) showed how the square root method can be used in the derivation of formulas in multiple prediction and in the computations necessary for their application. Hazewinkel derived a formula which relates the length of one test in a battery to the multiple correlation of the battery as a whole. A numerical example was also presented.

Berdie (1961) explored the effectiveness of moderator variables in improving predictions. His central problem was to find a basis for separating his subjects into relevant subgroups in order to maximize efficiency of prediction for each subgroup. The general hypothesis tested was that the variability of an individual's behavior on a test provides a basis for selecting such subsamples. A more specific hypothesis tested was that prediction will be less effective for persons whose test behavior is more variable than for persons whose test behavior is less variable. Evidence was found to support the latter hypothesis. Reasons for these results were not forthcoming from this study. Only a more sophisticated analysis was thought to be the key to a revelation of the relationships between predictor and criterion variables for different subgroups.

Ghiselli (1963) reviewed the literature on moderator variables, described several kinds of applications for them. and reported some of his own empirical research on their effect on reliability and validity. He concluded that although moderator variables appear to offer promise of great utility in improving validity and reliability, the time and effort devoted to developing and using them might be spent more profitably in seeking improvements along classical psychometric lines.

Chandler (1961) examined the conditions under which a variable with positive validity can function as a suppressor variable. He described a criterion for identifying such cases and presented two formulas for determining whether a suppressor exists. The formulas are relevant in a three-variable prediction equation when all the elements in the intercorrelation matrix are positive. The formulas show that (a) the suppressor effect disappears as the validities of the predictors become equal in magnitude and (b) the suppressor effect is most likely to occur as the absolute difference between the validities of the predictors increases. Furthermore, when the validity of a possible suppressor is near zero, a suppressor effect will prevail if the intercorrelation between the predictors exceeds twice the ratio of their validities.

Karon (1964) proposed a distinctive treatment of the commonly found age variable which is important to psychological and sociological research. Other variables are rarely related to age in a simple linear fashion except over a small range. The usual solution is arbitrarily to divide age into class intervals and to treat the intervals as a set of discrete categories. There are several objections to this procedure. When one considers the psychological nature of age, it would seem reasonable to treat it as a continuous variable but not as an equal-unit variable. The appropriate transformation ought to be one in which the rate of change per year is inversely proportional to age. There is the suggestion of a sort of Weber-Fechner law applied in the context of time. Karon indicated that if age is used in a regression equation it be transformed to a logarithmic function and then considered to be related to other variables as a second-degree equation. In an illustrative example in which he used data from the effects of segregation as measured by a projective test, Karon showed that there was a remarkably high degree of correspondence of the fitted second-degree equation to the observed means of arrays.

Lord (1962a, 1963) considered two cases in which the *multiple-cutting-scores* rather than the *composite-score* procedure was applicable. The assumptions as well as the mathematical model were substantially altered from the first to the second case. In both cases, the general conclusion was that when multiple-cutting scores are used with relatively unreliable predictors, one would probably do well to allow a high value on one predictor to compensate at least partially for a low value on another.

Additional References: Hall (1963); Hoffman (1962); McQuitty (1961; 1963a, b); Tucker (1963); Watley (1964).

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CHAPTER VIII

A Short Evaluation of the Research Reviewed in Educational and Psychological Testing

WILLIAM B. MICHAEL

This issue affords the first opportunity for a second evaluation of research in any one of the title areas of either a three-year or five-year cycle of the REVIEW. In February 1962, Harris wrote the first evaluation of the research that had been treated in the chapters of an issue of the REVIEW in the issue devoted to educational and psychological testing. In what may be viewed as a rather pessimistic assessment of the status of research in educational and psychological measurement at the end of 1961, Harris considered a number of points, among the most noteworthy of which were (a) the proper role of factor analysis in test development, (b) the relatively static level of predictability of tests of general and special aptitudes, (c) the lack of any new principles being proposed for the development of achievement tests as reflected, for example, by the absence of any influence of the *Taxonomy of Educational Objectives* (Bloom, 1956), (d) the omission of any discussion in the chapter concerned with achievement testing of the *process* or strategy of problem solving in concept attainment and achievement, (e) the utilitarian emphasis on validity coefficients in research on testing at the expense of interest in questions concerning why predictor variables behave as they do, (f) the injection of creativity as a new criterion which, with its inherent social significance, may pose the danger that an undue amount of effort in testing will be directed toward "how to maximize the prediction of this *new* criterion," and (g) the failure of the reviewers in the other chapters to indicate what, if anything, in measurement theory had changed as a result of work over a period of three years. In indicating that actually part of the problem for lack of concern of chapter reviewers with measurement theory could be attributed to the absence of publication of any comprehensive work, Harris strongly hinted that the assessment of change or growth was an essential topic in the theory of measurement worthy of extensive treatment.

Harris' points of concern serve as a partial basis for the generation of categories relative to which the research contributions reviewed in this issue may be evaluated, although substantial modifications are necessary. The principal dimensions about which the evaluation of the research reviewed in this issue will be made include (a) the use of factor analysis, especially with respect to intellectual development and creativity, (b) the utilitarian emphasis in relation to prediction, (c) advances in achievement testing, (d) trends in measurement of noncognitive characteristics, and (e) advances in measurement theory.

Use of Factor Analysis

In Chapter II, Millman and Glock appeared to agree with Harris' implications that if theory is not given a primary role and if empirical studies are not allowed to furnish both positive and negative answers, then factor analysis not only can turn up entities with specious psychological meanings but also can represent an essentially random process for generation of components that can be interpreted in a forced fashion as belonging to a theory. These writers shared Humphreys' (1962) opinion that many of Guilford's tests are measuring highly specific abilities of questionable psychological importance and that the factorially pure tests have not been useful in the prediction of complex criteria. Moreover, in their virtual rejection of factor analytic models of intelligence as useful bases for understanding the nature of intellectual organization, they seemed to favor placing reliance upon the developmental theories proposed by Piaget and his followers.

On the other hand, in taking an almost opposite position in Chapter III to that set forth by Millman and Glock in Chapter II, Merrifield strongly supported the significance of Guilford's contributions to the understanding of intelligence and creativity as well as the promise of the structure-of-intellect model as an informational theory of learning. It appears to the writer that Millman and Glock have been somewhat overly pessimistic regarding the potentialities of factor analysis as one basis for the understanding of the nature of intellectual functions. Admittedly, although the level of confidence with which one may make an inference concerning the existence of a psychological ability, function, or process from use of factor analysis may not be so high as one might desire, the careful design of factor analytic studies in which overdetermination of the structure is encouraged with respect to those measures employed to duplicate the hypothesized processes should serve to strengthen the probability of an accurate inference. Moreover, the factor analytic approach also permits the generation of new hypotheses to account for contradictory or unexpected groupings of correlated variables. In addition, frequent replication of studies should furnish additional information concerning the tenability of research hypotheses and of their consistency within the theoretical framework from which they were derived.

It should also be possible to combine factorial investigations to advantage with a traditional methodology of developmental studies of intelligence of the sort that Piaget and his students have followed. Factor analytic approaches could serve not only to confirm hypotheses regarding stages of intellectual development but also to extend and enrich the content of these developmental formulations.

As Millman and Glock suggested in Chapter II, Tucker's (1963b) new model for analysis of three-dimensional matrices affords a potential means for investigation of interrelationships of abilities for the same individuals on numerous occasions. This model should be useful in the study of the influence of periodically introduced changes in the environment on the creative potentialities of individuals. Along with the use of Tucker's model, the potential link afforded by relating Guilford's structure of intellect to each of the distinct stages of intellectual development set forth by Piaget and his followers may well be extended in a systematic way in order that clarification of the psychological characteristics of abilities involved at each of the stages of intellectual development may be effected.

From the standpoint of test development, many positive outcomes can be realized from the judicious application of factor analytic techniques. In short, as factor analysis serves to clarify the nature of psychological constructs, substantial modifications in test development as well as improved representations of psychological processes should be expected. In particular, relatively pure measures of single functions or traits can be rather readily constructed, although their predictive validities may be somewhat low.

In the development of test batteries, there appear to be limitations in the use of pure factor tests relative to the realization of a maximum degree of predictive validity for a composite of predictors. In light of the complex nature of criterion tasks that involve simultaneous use and application of more than one ability, it would not seem reasonable that batteries of factorially pure tests would necessarily predict quite so well as those batteries derived from use of a traditional multiple-regression analysis. In such an approach, predictor variables may be found to represent a combination of both factorially complex tests and occasionally factorially pure tests. In factorially complex tests the abilities measured can be expected to interact much as they would be expected to do in the performance of most criterion tasks.

Utilitarian Emphasis in Relation to Prediction

The concern which Harris expressed three years ago regarding the utilitarian emphasis on predictive validity coefficients might well turn into a nightmare if shortly before retiring some evening he should read certain chapters of this issue of the REVIEW. Indeed, in Chapter V the numerous studies which McCall cited concerning the measurement of vocational interests were strongly predictive in their emphasis. There appeared to be little concern in the contributions reviewed for a theory of vocational interest or choice, although an extremely limited amount of questionable research was done in the area of construct validation. McCall ably pointed out the lack of much concerted effort to relate interest measures to underlying motivational and learning variables in human behavior.

This same emphasis on predictive validity and on the citation of coefficients of correlation among test variables and criterion variables was amply clear in the studies mentioned both in Chapter VI on personality measurement by Gaier and White and in Chapter IV on achievement testing by Bligh. What perhaps is most distressing is that during the past 30 years relatively little gain has occurred in the observed magnitudes of validity coefficients of tests or of batteries of tests employed in the prediction of success in the academic setting, in the civil and military services, or in business and industry despite the rather extensive attention that has been given to the criterion problem.

Harris' expressed concern that creativity itself might become the new criterion toward which a disproportionate effort in testing and prediction would be directed has not materialized during the past three years, possibly because of the relatively conservative nature of most teachers and administrators in the educational setting as well as of personnel officers in the industrial and business world. Perhaps, in academic prediction, the emphasis on relatively immediate utilitarian values that reflect well-established patterns of conforming behavior and convergent thinking in the customarily employed criterion measure of grade point average rather than a concentration on the development of a dynamic theory of learning and teaching with its promising implications for an improved description of the criteria of academic success has served to perpetuate the status quo in the obtained magnitudes of the predictive validities for tests of general and special aptitudes. Indeed, the rate of growth of statistical sophistication has far outstripped what seems to be an almost asymptotic limit reached by predictive validity coefficients. Future progress would seem to accrue not so much from the development of increasingly complex techniques of statistical analysis but from bold new ideas that will serve to explain why individuals behave as they do in a variety of academic settings.

Advances in Achievement Testing

One bright note to dispel to some degree Harris' negative comment that Bloom's *Taxonomy* had had no influence on the construction of achievement tests was visible in Bligh's Chapter IV. At least two studies were cited in which a conscientious attempt had been made to duplicate in test construction the objectives of the *Taxonomy*. Again, contrary to Harris' experience, there were several other studies mentioned during the past three years in which problem solving and other higher level cognitive processes were important objectives to be evaluated in achievement tests. Thus, it seems that at last the *Taxonomy* is beginning to exert either directly or indirectly some degree of influence in the construction of objective achievement examinations. It may also be hoped that Mayo's (1964) careful efforts to establish the minimum levels of competence in measurement which are needed by teachers may actually influence the practices of these obviously important individuals who are indeed in the key position to improve evaluation practices.

Although, as reported in Chapters I and IV, several investigations involving minor technical gains in test construction, in administration and scoring, in norming and interpretive procedures, and in the facilitation of comparisons of new forms of tests with older forms were competently designed and carried out, there seemed to be no major significant advances or strikingly original contributions to research. As mentioned in the previous paragraph, the increased attention to objectives reflecting psychological processes has been a hopeful sign which suggests that individuals involved in the construction and utilization of achievement tests are beginning to emerge from the doldrums that Harris so pointedly mentioned.

Trends in the Measurement of Noncognitive Characteristics

Just as it appeared that there were few significant advances in the measurement of vocational interests, there was an absence of noteworthy progress in the research reported by Gaier and White in Chapter VI regarding the measurement of personality. Although there was a substantial amount of systematic effort expended in factor analytic studies, often at the expense of relating the definitions of the traits isolated to a theoretical framework, it may be that the computer simulation of personality will constitute an important avenue for basic research during the next few years. Despite the wealth of research on response sets, the basic issue concerning whether such sets reflect a style of responding to the individual items instead of reactions to their specific content was not resolved. Of at least moderate significance in the research reviewed were trends associated with (a) the attempt to clarify the meanings of the constructs of self-concept and body image and to show their relationship to personality development in conjunction with attempts at their measurement, (b) the formulation of a multidimensional interpretation of the concept of anxiety and the development of measures to take into account situational variables including both the task and the examiner, and (c) continued direction of effort toward achieving improved definitions and measures of a family of constructs associated with need achievement—especially in relation to the presence or absence of anxiety characteristics.

Although no attention in Chapter VI was given to Krathwohl, Bloom, and Masia's (1964) extension of Bloom's *Taxonomy* to the affective domain, brief mention was made of it by Moughamian in Chapter I. The schema afforded should offer teachers an important frame of reference in their writing test items for affective objectives in the curriculum. One can only hope that the lag between the appearance of this significant volume and its translation into active classroom practice will not be so great as that which arose in the instance of the *Taxonomy* in the cognitive domain edited by Bloom (1956). Certain individuals who are predisposed toward an attitude of cynicism with respect to educational measurement may well point out that if the delay in applying knowledge from the

Taxonomy for the cognitive domain was of the order of 6 to 8 years, the delay for the vastly more difficult affective domain may well run from 12 to 20 years. Even a short lag in the application of the principles set forth would be an unfortunate loss to the evaluation of important objectives in the learning process.

Advances in Measurement Theory

A consideration of the contents of Chapter VII, by Mayo, suggests that during the past three years the relative emphasis on applications of statistical methodology to problems in item analysis and selection, to estimates of test reliability, and to the development of norms has been more practical than during previous three-year cycles. However, in view of his elimination of consideration of the topics of factor analysis and scaling, which were covered in the December 1963 issue of the REVIEW, and of the material treated by Tucker (1963c) in the *Annual Review of Psychology*, and in light of the possibility of the operation of selective perception on Mayo's part, the emphasis portrayed may be unintentionally somewhat biased toward a practical orientation.

Harris' observation that during a three-year period from late 1958 to late 1961 little concern was given to measurement theory may have been sustained to some extent during the last three-year period. However, there have been at least three significant developments that should be mentioned. Particularly noteworthy was *Problems in Measuring Change*, edited by Harris (1963), which contains the contributions of distinguished participants at a three-day conference beginning on April 30, 1962, at the University of Wisconsin. In this collection of papers will be found the one by Tucker (1963b) concerning the analysis of three-way matrices for measurement of change, to which previous reference has been made. This valuable book should fill an important gap in measurement theory, the significance of which Harris clearly anticipated in his evaluative chapter in the February 1962 issue of the REVIEW.

Another noteworthy contribution was the monograph by Tucker (1963a), *Formal Models for a Central Prediction System*. His objective was to develop a system for predicting the performance of students at a number of different colleges when allowances were made systematically for differences in secondary school grades as well as for introduction of new variables such as test scores. Tucker's work represents a highly sophisticated extension and improvement of the objectives which Bloom and Peters (1961) presented in *The Use of Academic Prediction Scales for Counseling and Selecting College Entrants*.

Ghiselli's (1964) *Theory of Psychological Measurement* constitutes the third major contribution to the theory of measurement. It may be expected that the teaching value of this text will be a relatively greater influence than will be its impact on research practices. One may hopefully anticipate that it will encourage competent undergraduate majors in psychology as well as graduate students in both psychology and education to direct their efforts toward further studies in measurement theory.

What impact the volumes edited by Harris (1963) and prepared by Tucker (1963a) will have upon educational and psychological measurement and especially upon its practice remains to be seen. The availability of electronic computers with tremendous storage capacities should make possible the relatively easy application of many of the quantitative formulations that were developed. In short, the advances in measurement theory during the past three years seem to have altered the implied lack of progress set forth by Harris in his evaluative chapter.

Conclusion

During the past three years, the research reviewed in educational and psychological testing has shown evidence of being only slightly more imaginative in conception, somewhat more rigorous in design, and considerably more extensive in scope than that reviewed during the previous three-year period. Although no major breakthroughs were effected, the research studies reviewed reflected (a) continued and expanding use of factor analysis, (b) systematic efforts directed toward the study and measurement of intellectual development and organization, (c) a concern for measurement of process objectives in achievement examinations as well as for evaluation of affective objectives in the curriculum, (d) only slight advances in the measurement of vocational interests and personality characteristics with the possible exception of the potentialities afforded by initial research efforts in computer simulation of personality, and (e) a modest degree of over-all progress in measurement theory, although the contributions to the assessment of change in the volume edited by Harris (1963) and the two publications of Tucker (1963a, b) devoted respectively to the development of a formal prediction system and to the factor analysis of three-dimensional matrices were particularly noteworthy. Welcome as major advances in statistical methodology may be, the critical need in educational and psychological testing is not for additional statistical sophistication but rather for the formulation of a comprehensive and workable theory of the teaching and learning process to which measurement and evaluation procedures can be meaningfully related.

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Educational Programs: Early and Middle Childhood

Reviews the literature for the five-year period
since the issuance of Vol. XXIX, No. 2, April 1959.

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NANCY S. MELTZER, *Co-Chairman*, Cornell University, Ithaca, New York
MAURITZ JOHNSON, Cornell University, Ithaca, New York
JEROME E. LEAVITT, Portland State College, Portland, Oregon

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GLORIA F. LEIDERMAN, Stanford University, Stanford, California
ANITA SIMON, Temple University, Philadelphia, Pennsylvania
JOANNA P. WILLIAMS, University of Pennsylvania, Philadelphia, Pennsylvania

FOREWORD

It is customary, we know, to compare the states of the field between the previous and current issues of the REVIEW. However, we would prefer to extrapolate the trends, many of which are obvious, to what we might expect of research on early childhood when the next issue of the REVIEW on this subject is prepared. Some nascent tendencies are worth noting: (a) The ties between educational research and practice and basic research issues will become closer. In this issue, for example, Williams' summary of research on reading indicates the analysis of this complex process into basic perceptual and learning issues; Huttenlocher points to some exciting research on cognitive development that may provide the research direction for mathematics and science curricula that Leiderman describes. Baldwin ties classroom interaction to psychological ecology, and the extensions of Hartup's review of social behavior to the ubiquitous problems of classroom motivation seem obvious. (b) New curricula will continue to be designed for the elementary grades, with attention to special groups (see Chapter V) and for younger than usual age groups, as indicated by Williams and Leiderman. We would hope that these curricula will be subjected to the intensive *in situ* observation that Amidon has described for socioemotional variables.

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Harry Levin and Nancy S. Meltzer
Co-Chairmen, Committee on Educational Programs: Early and Middle Childhood

CHAPTER I

Naturalistic Studies of Classroom Learning

CLARA P. BALDWIN

Despite the justifiable criticisms and cautions regarding the use of naturalistic observations for studying the behavior of children and of their teachers, several studies within the past six years have made valuable contributions to methodology, identified categories of teacher and child behavior important to the study of classroom problems, and yielded findings regarding these problems. The brevity and purposes of this chapter make it necessary to limit the review to that research which appears to be most fruitful and most soundly conceived.

Psychological Ecology

Barker and Wright and their associates, adding the concept of psychological ecology to the methodology of naturalistic observations, have for several years investigated the behavior of children in various behavioral settings in order to build a science of the behavior of children. Their methods of recording behavior and some of the comparisons of settings in which these concepts and methods of psychological ecology have been used were described by Barker and Wright (1954) and by Wright (1960). Wright and others (1951) concentrated on the school as one of the settings in which all children in a society spend much of their time. They described the importance of obtaining observations of classroom behavior and conditions in order to increase understanding regarding both laws of social behavior and social characteristics of individual pupils. In this paper were presented data and sample scoring of classroom behavior of a 10-year-old boy from the Midwest study.

Kerkman (1963), in his doctoral dissertation completed under Wright's direction, described differences in behavior patterns in nine city (population of about 25,000) classrooms and nine town (a number of small villages with populations of about 750) classrooms. Three classes each at the first, third, and fifth grade levels were observed. Classroom behavior was recorded with a time-lapse motion picture camera which automatically recorded one picture per minute throughout the school day. Twenty-one scoring categories were defined and applied to the 10 "most visible" children—five boys and five girls—in each scene. These activities were classified into five main categories, with subdivisions: (a) conformance—degree to which the children meet the claim of the setting, the claim defined by the demands that the physical and social milieu make of the child—(b) nonconformance, (c) semiconformance, (d) social components, (e) residual base measures—negative affect, good motor tone, etc. A frame-by-frame analysis was made on the behavior of each of the 10 subject children, and rater agreements ranged from 84.7 percent to 99.3 percent, with a median of 95.6 percent. Over three-fourths of the behavior conformed to the claim of the setting, while the remaining behavior was nearly equally divided between nonconformance and semiconformance. The four most prevalent behaviors in all schools were sedentary bookwork, attending to teacher, looking away, and communicating with peers. Pupil behavior showed marked similarities in the different sized communities. Nevertheless, organized group participation, attending to teacher, and total teacher-child interaction were more prevalent in the city, while autonomous action by the child, heterogeneity of pattern, and engaging of the teacher occurred more frequently in town. In both types of community, independence of the child's activity increased, and teacher-organized activity decreased, with grade level.

Shure (1963) adapted Barker and Wright's idea of psychological setting to the study of the nursery school. Shure's is the only recent naturalistic study of preschool programs. She divided the indoor area of the nursery school into five activity settings: block corner, art area, housekeeping area, story area, and science corner. Using a time-sampling technique, she observed these five areas during the free play period for number of children using the area (population density), amounts of several kinds of social participation, constructiveness, and affect. She found that there were different population densities as well as different kinds of child behavior in the various areas. Her hypothesis was that the different activities of a nursery school may, in the language of Barker and Wright, "coerce" certain kinds of child behavior. Since this study was carried out in only one school and with one teacher, much further work needs to be done to document the findings. In light of the upsurge of interest in educational programs for young children and the lack of systematic research and empirical data concerning nursery school education, this line of investigation should be extended.

Achievement and Self-Esteem

For the past several years, Sears (1957, 1963) has been engaged in a large-scale research program utilizing behavior observations as well as other measures to study the achievement and self-esteem of elementary school children within their classrooms. She developed measures of the study of relationships between classroom variables (teacher behavior, teacher preferences for school activities, teacher perceptions of individual children, and peer perceptions and liking for other children) and certain educational outcomes on the part of the children (self-concepts, liking for other children, task-oriented classroom behavior, achievement test scores, attitudes toward school activities, and creativity test scores).

Several findings from Sears's (1963) major study, which involved 195 children and 7 teachers in the fifth and sixth grades, are concerned with the relationships between teacher behaviors and some of the pupil "target variables." Among the findings reported by Sears (1963) are these: (a) Children of superior mental ability who received high scores on creativity tended to have teachers who rewarded children individually with personal interest and praise. These teachers avoided rewarding by evaluation of the children's performance. (b) In contrast, in classes preoccupied with task-oriented work, teachers' rewards tended to be given in evaluative terms, and to the group rather than to individuals. They tended to teach by direct presentation of information. (c) Achievement test scores of superior boys were predicted by such teacher behaviors as rewarding by emphasis, punishing by reasoning, and asking for explanations. Sears commented: "Sheer frequency of independent, task-oriented work does not guarantee a payoff in better scores on achievement tests for most children in the sample, but it is associated with good self-concepts and/or liking by others for the children who are below the group mean in mental ability."

Three of Sears's students reported the development of two of the behavioral measures and data secured through their use. Kowatrakul (1959) described the category system used in the point-time sampling technique for studying children's task-oriented classroom behavior. She reported that some 80 percent of observed behavior in 59 fifth graders and sixth graders was in teacher-approved categories. Children were most "intent on ongoing work" when they were engaged in "independent seat work" and "watching and listening" activities. There did not appear to be significant differences in attentiveness to work going on in different subject matter areas in the sixth grade, though subject matter had an effect in the fifth grade. Melville (1959) utilized two of the categories from this observational schedule to compare the industrious behavior of children in first and second grade classrooms with their achievement and work-oriented responses in a standardized doll play situation. She found that children who scored high in industrious behavior exhibited consistent kinds of behavior in their doll play: children who were intent on classroom work much of the school day frequently depicted child dolls as being involved in similar activities. Spaulding (1964) analyzed teacher-child transactions in a study in which teacher verbalizations were recorded with a neck microphone, a radio transmitter, and a tape recorder and were scored in one of eight categories. Spaulding collected data on teacher behavior in 21 fourth and sixth grade classrooms in nine elementary schools of an upper middle class suburban California city. Teacher behavior was categorized as follows: approval, disapproval, instruction (managing, structuring), listening, observation, personal activity, communication with adults, and temporary absence from classroom. Using these teacher behaviors (factor-analyzed into 17 factors) as antecedent variables and several pupil target variables as consequent variables, Spaulding tested a number of hypotheses. Some of his major findings were these: (a) the 21 classrooms were significantly different on all the pupil target variables; (b) level of self-esteem was related positively to one component of teacher behavior, namely "calm, acceptant transactions in general with private individualized instruction and concern for divergency, attention to task, and use of task-appropriate procedures and resources"; (c) the category of "businesslike lecture methods with insistence upon attention to task and conformity to rules of procedure" was found to be correlated significantly with pupils' gains in reading and mathematics and with problem-solving performance. There was a negative relationship between dominating-threatening teacher behavior and pupils' gains in reading. Also of interest to those concerned with observations of classroom behavior is the book of case studies of individual children from this research program.

In contrast to the studies reported in this chapter which presented group data only, a recent book by Sears and Sherman (1964) included data from a variety of measures and behavior observations on individual children.

Teacher Effectiveness

Medley and Mitzel have been engaged in observational studies as part of a longitudinal study of teaching effectiveness. Their first step was to develop a simple observational scheme which could be reliably used by observers with a minimum amount of training and which would enable them to collect data on teacher behavior in a large number of classrooms. Drawing on the methods of Cornell, Lindvall, and Saupe (1952) and of Withall (1951), Medley and Mitzel developed a measure known as the *OScAR* (*Observation Schedule and Record*). Medley and Mitzel (1958, 1963) described the development of this schedule and reported differences among 49 beginning teachers scattered over grades 3, 4, and 6 in 19 schools in the New York City school system. The data were first analyzed to select the variables that showed reliable differences among the classrooms of the different teachers. Those items which discriminated well were combined into 14 keys on the basis of a priori judgment. Some examples of these keys are problem-structuring teacher statements, autonomous administrative groupings, freedom of movement, manifest teacher hostility, and supportive teacher behavior. Reliability coefficients on the keys ranged from 0.61 to 0.91. A factor analysis of the 14 keys resulted in three factors: (a) warmth of emotional climate, (b) degree of verbal emphasis, and (c) prevalence of pupil-initiated activities.

In another study, Medley and Mitzel (1959) correlated the factor scores for these 49 classrooms with five measures of teacher effectiveness: (a) adjusted reading growth, (b) growth in group problem-solving skill, (c) pupil-teacher rapport, (d) teachers' self-ratings, and (e) principals' ratings. No significant relationships were found between measures of classroom climate, verbal emphasis, or social organization (the three factors from observational data) and any of the five measures of effectiveness.

Summary and Conclusion

In spite of the diversity of the questions being investigated by the various researchers, the observational categories employed are surprisingly similar. For example, disapproval, approval (sometimes including warmth, support, or hostility), and directing (managing, structuring) occurred in all the observational schedules of teacher behavior. The child behavior category systems of both Sears and Wright were aimed primarily at the motivational aspects of children's classroom behavior and their responsiveness to the "claim" of the academic classroom. This agreement among researchers in identifying similar variables may be a good indication of the importance of these behaviors.

The studies all reported satisfactory observer or rater agreement in observing, recording, and rating the behaviors being studied. Medley and Mitzel (1963) pointed to the importance of estimating both observer agreement and stability of behavior as aspects of reliability; they described measures of both.

The technology of recording included the traditional observational procedures and two newer techniques—one used neck microphones with radio transmitters; the other, automatic photographic recording. Although they pose problems, both of these latter techniques hold promise for future use. Medley and Mitzel noted that, because of background noise in recording teacher verbalizations electronically, they found observers to be more effective recorders. Wright, in a personal communication, commented that while the photographic technique picked up much of the formal pattern of classroom functioning, it lost most of the content of what was going on. Spaulding mentioned having used an observer in the classroom together with the radio transmitter, though he did not describe the function of the observer. For simple and efficient on-the-spot recording by observers, both the *OScAR* and the Sears category systems seem very useful for further studies of specific kinds of behavior of children or teachers. One might hope that future researchers will utilize and build on the work already accomplished in all these studies rather than resort to the development of completely new systems.

The most striking feature of these studies is the failure to find clear relations between descriptions of teaching behavior and measures of the outcomes of the educational process. Variables such as fantasy measures of industry and self-esteem are related to pupils' classroom behavior, but such variables as academic achievement and growth in skills are not consistently predicted by any of the classroom variables employed in these studies.

One problem certainly concerns the measures being used to describe teacher-child classroom interactions. Measures of the behaviors presently used in observational studies on both teachers and children have been restricted primarily to social-emotional and motivational factors. There are almost no studies of the subject matter content of teacher-child interactions or of the way teachers actually present new information, answer questions, or encourage a search for underlying principles. These behaviors should relate to pupils' cognitive development, and the fact that teachers can validly judge their own skill in presenting subject matter (Medley and Mitzel, 1959) gives hope that aspects of cognitive development can be detected in observations of teacher-child interactions.

But even though the variables employed in present studies are not explicitly cognitive, it is still a surprise and a disappointment that they do not relate to educational outcomes. Does it really make little difference whether a teacher is warm or hostile? Is a child's industriousness in school (high for many pupils, according to both Kerkman and Kowatrakul) actually unrelated to academic growth? At the moment, the data can be so interpreted, but such an interpretation does not fit with the more general theories of child development that are currently finding empirical support. For example, the role of warmth between children and adults in the child's imitation of adult behavior (Bandura and Huston, 1961) and in the development of conscience and acceptance of adult standards (Sears, Maccoby, and Levin, 1957) suggests that warmth facilitates the child's acquisition of information. These studies indicate that a warm teacher-child relationship is an important but not sufficient prerequisite for optimal cognitive development. On the other hand, a global warmth or approval that does not discriminate between those child behaviors that are approved and those that are disapproved might well not show any facilitative effect on cognitive development. Thus it may be that pupil growth in cognitive skills will in future studies be related to the interaction of social-emotional and cognitive variables in teacher-child interaction. Sears (1963) indicated that teacher behaviors have different effects on children of differing mental abilities and sex. Such data point to the importance of considering the effectiveness of certain teacher behaviors in relation to specific groups of children within total classrooms.

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CHAPTER II

Children's Intellectual Development

JANELLEN HUTTENLOCHER *

Within the past six years, the period with which this chapter is concerned, children's intellectual development has been studied extensively. The brevity of this chapter precludes even summary treatment of the entire field. Therefore, only two topics have been selected for discussion, and even these are treated very selectively. The child's acquisition of his native language will be treated first, followed by the development of his thinking processes between the age of four or five years (after he has mastered the essentials of language) and the beginning of adolescence (when he is generally believed to function as an adult).

Acquisition of Language

The acquisition of language is a central feature of the child's intellectual development during the preschool period and represents an achievement of considerable complexity. The young child determines from the speech around him the rules that govern its usage so that he is able to understand and to produce well-constructed utterances. Systematic consideration of this achievement is one of the major recent advances in the study of children's intellectual development. While earlier studies measured mastery of language in terms of vocabulary size and sentence length, attention has now become focused, in the words of a recent conference, on "acquisition of language-as-it-is-described-by-linguistic-science" (Bellugi and Brown, 1964). This work explores the evolution of syntax, tracing the child's implicit rules for combining words from the earliest multiple-word utterances until the period when the child's speech approximates that of an adult.

At the age of about one year the child makes his first meaningful utterances. These are generally single words (*daddy*, *light*) and occasionally short phrases used as single words (*gimme*). They designate objects, people, or complex situations. Many more single-unit utterances occur in the following months, and at about 18 months these units are first combined. By the time the child is three and a half, his speech is very similar to adult speech.

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Development of Syntax

Several observers have recorded the earliest combinations of words (Braine, 1963; Miller and Ervin, 1964; Brown and Fraser, 1964). The latter two articles have traced development throughout the succeeding two-year period. The first two-word utterances have a characteristic form noted by all observers. They generally include words in two classes: One class contains few members that are used with high frequency (e.g., *see*, *where*). These have been called operators or pivots. The other class includes all other words. Once the child combines one operator with another word, he often begins to combine it with a host of words (e.g., "see doggie," "see light"). For a brief period thereafter, all the child's speech consists of such two-word phrases. Over the next months such expressions gradually become elaborated. For example, some steps in the progression of a child's description of a cat lapping milk might be "milk," then "kitty drink," then "kitty drink milk," and finally "the kitty is drinking his milk." At any one of these points in speech development, all of his utterances are of similar length and complexity. Whether the child is expressing himself or attempting to imitate an adult, the form of his speech is rather similar; the child who says "kitty drink" spontaneously is apt to imitate his mother's "the kitty is drinking his milk" as "kitty drink." Consistently omitted in the early forms of speech are function words, verb and noun inflections, and auxiliary verbs. The child relies heavily on content words, generally producing these in the order in which they occur in adult speech.

As the child begins to use plurals, to vary his verb forms, and so on, the types of mistakes he makes indicate that the rules the child follows are overgeneralized and do not encompass exceptions. For example, irregular verbs are regularized, as when the child says "I goed," an overgeneralization of the rule for forming the past tense.

The early forms of speech are far from a random selection from adult output. Rather, those words are included which convey the major meaning of a message, and thus this speech has been described as *telegraphic* by Brown and Fraser (1964). Although the very young child has not yet mastered the entire set of rules governing what he confronts, his systematic reductions result in fairly good communication. Brown and Bellugi (1964) pointed out some factors that may explain how the child manages to extract the most meaningful words from fairly complex utterances. First, these content words are the type of words that the mother may have practiced with the child one at a time. For instance, concrete nouns are often paired with objects: the mother picks up an orange and says "orange." Familiarity with a word may make it easier for the child to isolate the word from the context of a sentence and might be expected to make him more likely to use it himself. Further, as Brown and Bellugi pointed out, content words receive the heaviest stress by adult speakers and may be easiest to hear. Brown and Bellugi also considered the problem of how the child's telegraphic speech becomes elaborated. Possibly, constant exposure to adult speech is sufficient for the child to elaborate his own; these authors, however, pointed to a further possible mechanism. Mothers, they noticed, tend to imitate the speech of their children, but in an elaborated form. If the child says "kitty drink," the mother is apt to say "yes, the kitty is drinking his milk." Such expansion by the mother may be important, because it provides a close comparison between the child's utterance and the adult form of that same utterance.

Other Considerations

Certain more general theoretical issues in language development have recently concerned psycholinguists. Several writers have expressed their belief that the general principles of association, reinforcement, and generalization derived from learning experiments with animals are inadequate to explain the important facts about language (Chomsky, 1959; Lenneberg, 1964; Miller, 1964). Learning theorists have claimed, for example, that children acquire language through imitation. Imitation, while clearly a factor, hardly seems a sufficient explanatory principle. The child does not imitate adult speech as he would a sequence of random items. When a random sequence exceeds the memory span, the middle items tend to be forgotten, and the first and last items tend to be retained. Instead, as we have seen, the child's reduction of adult speech efficiently extracts the most highly informative items. Further, the child's usage at each point in his development is quite systematic and can be described as following a set of rules.

The consistency of children's speech development, as well as the great similarity in the form of early speech in different children, has suggested to certain authors that the nature of the human nervous system should be more seriously considered in studying language development. They have suggested that one take account of the built-in structure of the information-processing system that enables the child to learn the complex rules of grammar (Lenneberg, 1964; Miller, 1964). Lenneberg has argued that speech should not be considered purposive behavior carried out for gain, but rather an inevitable accomplishment given the structure of the human organism.

In a book written about 30 years ago but only recently available in English, Vygotsky (1962) discussed the evolution of language in the child's thought. In early childhood, he maintains, language serves mainly social functions; later, it becomes internalized as the instrument of thought. In a recent paper, Bruner (1964) discussed the modes of thought preceding the use of language: *enactive*—the internalization of sensorimotor acts—and *iconic*—internalization of images. These ways of representing the world, Bruner notes, are far more limited than the *symbolic*—language—mode. When language is internalized, the possibilities for manipulation and for consideration of hypothetical occurrences are vastly increased.

Cognitive Learning Between Ages Four and Twelve

While the child rapidly attains the rules of grammar, he grasps more slowly many other lawful relationships, such as certain general physical principles. Psychologists and educators are currently concerned with a related group of questions about school-age children. How much and what do children understand at particular ages? How much more can they be taught at these same ages? In what ways can information best be presented to them?

Piaget's Position

Recent discussions of the above problems drew heavily on the theoretical and empirical studies of Piaget. While much of his published work predates the six-year period with which this chapter is concerned, his impact on thinking in this country is clearly contemporary, dating in large part from the English translation of *The Growth of Logical Thinking from Childhood to Adolescence* (Inhelder and Piaget, 1958). A detailed book-length summary of Piaget's contributions has just appeared (Flavell, 1963), and other summaries have been published recently (Hunt, 1961; Wallach, 1963).

Piaget suggests that the child goes through a series of stages in his progression toward intellectual maturity. During each stage, the child has characteristic ways of viewing the world. That is, his thinking has a different structural organization at various points in his development. During each stage, the structure of the child's thinking for a time assumes a stable form. Further, the principles of organization during each stage are considered quite pervasive, characterizing the child's mode of functioning in a wide variety of situations.

The age period of concern here, from age four or five years to adolescence, spans two major distinct stages within Piaget's system. The first, *preoperational*, lasts until about seven years. The second, the stage of *concrete operations*, emerges at about seven years and extends until the start of adolescence. In the preoperational stage, it is claimed that the child lacks understanding of certain basic relationships between objects. For example, he cannot order them along a dimension, such as height or weight, and he is unaware that quantity remains constant despite changes in spatial arrangement. The inability to conserve quantity results because the child does not understand that spatial rearrangements are reversible.

Lack of conservation has been demonstrated in a variety of situations: e.g., if two equivalent groups of objects are differently arrayed (one spread out and the other closely clustered), the child does not recognize that the number of objects is equivalent. Even after he has learned to conserve number, he fails to conserve volume. If water in a jar is emptied into one of different shape, the child says the amount has changed; if the new jar is taller and narrower, he believes there is more water; if it is shorter and wider, he believes there is less water. The child at this stage places great reliance on immediate perceptual clues: one arrangement "looks like" more.

In the following stage of concrete operations, it is claimed, the child can carry out the operations of ordering and reversing and so can understand relationships between objects, but he still lacks the ability to formulate propositions and consider possible relationships between them; i.e., he cannot specify in advance all hypothetical possibilities in a systematic fashion.

Piaget and Current Approaches to Thinking

Piaget's theory, while formulated in large part some 30 years ago, has much in common with more recent approaches to adult cognitive functioning. Newell, Shaw, and Simon (1958) suggested that we treat the problem solver as a "system for information processing" in possession of memories, operations for acting on memories and incoming stimulation, and rules for combining operations into larger programs for processing information. Bruner, Goodnow, and Austin (1956) have examined in detail the various *strategies* (a word essentially synonymous with *programs*) used in obtaining answers to certain concept-formation problems. Miller, Galanter, and Pribram (1960) suggested that people's activities be examined in terms of the *plans* (also synonymous with *programs*) that guide them. Piaget's work can be described as an attempt to specify this information-processing system at various points in its evolution.

Recent studies of intellectual development not closely related to Piaget's work likewise concern the evolution of systems for processing information. For example, the above discussion of language development indicates that the child goes through a sequence of stages, possessing at each point a program for forming utterances. Early programs are both simpler and different from later ones. The evolution of strategies for grouping objects was studied by Bruner and Olver (1963). Young children tend to group objects by a common characteristic that relates the last object to the one immediately preceding. Finally, after adopting certain intermediate strategies, older children group objects into a superordinate class that includes all members. Huttenlocher (1964) found that children approach certain formal reasoning problems with the same strategy as adults, but may fail to execute the entire sequence of operations required.

Experience and Cognitive Learning

The sources of progression toward maturity are somewhat obscure in Piaget's writings. While the importance of the child's interaction with his environment is stressed, the rough designation of the ages at which particular modes of functioning appear suggests limits to educability within particular age ranges. In his experiments, Piaget tested the child's reactions to certain problems but did not attempt to teach. This procedure reflected his belief that the child's mode of functioning at each stage of his development is stable and not easily altered.

Recent experimental attempts to train the preoperational child in the use of concrete operations have had rather limited success. For example, Wohlwill and Lowe (1962) attempted to train children to conserve number. Different groups were trained (a) in counting elements before and after spatial rearrangement or (b) in adding or subtracting elements to illustrate those operations that do change number or (c) in dissociating number from configuration by arranging and rearranging elements. A fourth group served as a control. All groups improved somewhat (including the control group), but there were no differences among them. Smedslund (1961) likewise had limited success training children to conserve quantity given a plasticine ball that changed shape. He also found that training did not convey a sense of what he called "logical necessity." When, by secretly removing some plasticine, he tricked those children he had trained to conserve quantity, they were ready to renounce the principle of conservation. This was not true of children who came into the experiment in possession of the notion of conservation. The training sessions in such experiments were comparatively brief. It is not clear whether these procedures should be regarded as sufficient for acquisition of the general notion of conservation.

Hunt (1961) discussed at length the manner in which experience may affect intellectual development. He maintained that the rapidity with which the child proceeds through Piaget's stages of development depends on the richness of his environment. His conclusions were drawn largely from experiments with animals. For example, it has been found that the amount and variety of stimulation to which young animals are exposed affects markedly their ability to learn when mature. Hunt also cited experiments on the development of learning sets. These experiments showed that after a great number of similar learning problems, primates become highly efficient in dealing with new problems of the same type. Their performance indicates acquisition of a systematic mode of approach or strategy. Such strategies evolve only after fairly lengthy training. Perhaps the training provided by the child's natural environment is often too haphazard or not sufficiently prolonged for efficient development of those strategies of which the child is actually capable. This point of view suggests that the young child may be limited by ignorance of adult modes of approach rather than by his anatomical or physiological development.

In *The Process of Education*, Bruner (1960) discussed the child's readiness to learn. He suggested that, in the absence of evidence to the contrary, one assume that judicious choice of the mode of presentation may permit one to teach anything to children of any age. Pointing to the primary school child's difficulties with formal symbolic presentation, he advocated use of concrete materials. He suggested a spiral curriculum in which the same material is presented at different ages with demonstration gradually replaced by formal argument as the child matures.

Perhaps, within the next few years, the present joint efforts of educators, specialists in particular disciplines, and psychologists will do a great deal to resolve our present uncertainties about children's potential intellectual achievement.

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CHAPTER III

Social Behavior of Children

WILLARD W. HARTUP

Social behavior consists of activity elicited by stimuli emanating *from* people or activity which, in itself, possesses stimulus value *for* people. More than half of the literature in child psychology published since 1958 is concerned with some aspect of social behavior. Two areas of research have been chosen for review in this chapter: (a) the effects of social reinforcement on children's behavior and (b) imitative behavior in children. Obviously, only selected trends in the methodology and findings of research in these areas can be indicated.

Social Reinforcement

Praise, approval, verbal demands, and reproof are well recognized as the stock-in-trade of every parent and every teacher for bringing about changes in the behavior of children. Nevertheless, a systematic body of knowledge concerning the consequences of social reinforcement has been late in emerging. Recent research consists largely of direct, empirical attempts to understand how children behave under various contingencies of reinforcement by adults. Formal theory has not played a very large role in shaping this research. Existing data clearly indicate that social forms of reinforcement are complex types of reward, in that numerous conditions determine the effectiveness of social rewards in a given situation. As yet, however, psychologists have not developed a parsimonious set of integrating principles (a theory, in other words) which will effectively serve to organize and clarify the rapidly accumulating empirical evidence. Thus, Horowitz (1963) suggested that a reader of this literature may well feel that "while much is known, little is understood."

Most of the recent studies of children's responsiveness to adult reinforcement have utilized simple, short laboratory tasks. Factors influencing the effectiveness of social reinforcement have been observed most frequently with such tasks for the child as dropping marbles through holes and pulling levers. Much has been learned by observing children's performance on these simple tasks, but the degree to which the findings may be generalized to life situations is restricted. Also, most of the recent research has involved adult reinforcement of children's behavior; little is presently known about such significant phenomena as children's reinforcement of adult behavior or of peer behavior.

Demographic Factors

Characteristics such as the child's sex, chronological age, mental age, and social class background have been investigated as factors affecting responsiveness to adult praise and approval. The sex of the child, in relation to the sex of the adult who dispenses reinforcement, has been found consistently to be associated with performance in socially reinforced tasks. As a case in point, Stevenson (1961) reported that older preschool and younger elementary school boys performed better than girls on simple tasks when praised by a female adult, while girls performed better than boys when praised by a male adult. Similar results were reported by Gewirtz and Baer (1958b) for nursery school children and by Stevenson and Knights (1962) for retarded children. There is indication that this cross-sex effect extends beyond the preschool and middle childhood years. Stevenson and Allen (1964) reported that college-age women had higher rates of response on simple tasks when praised by men than when praised by women, while male undergraduates responded better when praised by women than by men.

Clear individual differences exist among adults in their effectiveness as reinforcers of children's behavior. For example, Stevenson (1961) reported significant individual experimenter differences in reinforcing effectiveness when 12 adults were employed as experimenters. Individual differences tended to be more marked among female than among male experimenters. Women who were effective reinforcers of young children's behavior tended to be less effective with older children and vice versa. On the other hand, the men who tended to be effective with young children tended also to be effective with older children. The personality and behavioral characteristics of adults which make them effective reinforcers of children's behavior have proved difficult to isolate, and definitive results have yet to be published.

Age differences in children's performance under praise, criticism, and passive attention from adults were studied by Stevenson and Cruse (1961). The data suggested that social reinforcement was more effective for 5-year-olds than for 12-year-olds, but both groups did better under social reinforcement than under passive attention. The results indicated that the older children may have been uninterested in the simple marble-dropping task employed in the study; however, under criticism, the older children performed vigorously while the younger children quickly gave up. Results concerning the relation between mental age and socially reinforced performance indicated that responsiveness to praise and approval is positively related to mental age up to an intellectual level between five and seven years. However, for children above this mental age level, no such relation apparently exists (Stevenson and Fahel, 1961; Stevenson and Snyder, 1960; Zigler, 1963).

Social class differences were reported by Zigler and Kanzer (1962), who found that praise was less effective with middle class children than were adult statements relating to the correctness of the child's performance.

On the other hand, lower class children performed a simple task better when praised by an adult than when they were just told they were *correct* or *right*.

Other data on subject and experimenter characteristics which influence children's performance in socially reinforced tasks indicate that unfamiliar adults are generally more effective in influencing children's performance by means of praise and approval than are parents of either sex (Stevenson, Keen, and Knights, 1963). Finally, Hartup (1964) reported that when either preschool or elementary school children are praised by their peers, performance is better maintained when the reinforcing peer is a disliked or unpopular child than when he is liked or popular.

Social Deprivation

Several studies have been concerned with the effects of brief periods of minimal social contact on children's responsiveness to praise and approval. For example, Gewirtz and Baer (1958b) found that praise produced greater changes in the performance of preschool children on simple tasks when preceded by a 20-minute period in which children were left alone in a laboratory room than when preceded by no specific waiting period. Quite similar results were obtained in a second study by Gewirtz and Baer (1958a), which involved first grade children. Praise and approval had the most marked effect when used after 20 minutes of social isolation, next greatest effect when used after no specific waiting period, and the least effect when used following 20 minutes of comfortable interaction between the child and the experimenter. Other findings, generally consistent with these results, were reported by Hartup (1958), Stevenson and Odom (1962), and Erickson (1962).

The mechanisms underlying these experimental results have not yet been made explicit. Gewirtz and Baer argued that a period of brief isolation arouses a social drive analogous to the hunger drive produced by food deprivation. Erickson's data provide the clearest support for this contention, since she found that isolation enhanced the performance of sixth grade children when praise was used as the reward, but did not affect performance when a marble was used as the reward. Walters and Ray (1960) suggested that social isolation produces its effects on performance through arousal of anxiety, and Hill and Stevenson (1964) discussed the possibility that isolation motivates the subject as a consequence of general stimulus deprivation. At the moment, the fact that minimal social contact enhances socially reinforced performance is much better established than is the nature of the psychological processes eliciting this effect.

Personality and Behavioral Correlates

Investigation of children's personality and behavioral correlates of responsiveness to social reinforcement has not been extensive. Perhaps the best-substantiated finding is that the effects of praise and approval are somewhat greater for children evidencing strong, as opposed to weak, dependency needs (Endsley and Hartup, 1960). There is also a dearth of knowledge concerning child rearing antecedents of responsiveness to social reinforcement. Some indication exists, however, that children whose parents frequently use praise and approval are less responsive to social reinforcement in simple laboratory tasks than are children whose parents are somewhat less effusive or more laissez-faire in their approach to child rearing.

Research interest in social-reinforcement effects on child behavior remains intense. During the past six years, there has been a remarkable increase in knowledge concerning the effects of praise, approval, and criticism on children's behavior. Much remains to be done. The generality of the results already obtained needs to be tested in terms of performance on other tasks and in life situations. Also, further research is needed concerning the basic motivational and cognitive consequences of social deprivation, social disapproval, and the like.

Imitation

The behavior of social models functions importantly in transmitting both deviant and socially approved patterns of behavior to young children. Bandura and Walters (1963) cited three possible effects of exposure to a model: (a) a modeling effect, whereby precisely imitative response patterns not previously present in the observer's repertory are transmitted, (b) inhibitory or disinhibitory effects, whereby the frequency or intensity of previously learned response patterns is altered by observation of a model, and (c) elicitation effects, whereby observer responses are evoked which are not precisely imitative but are similar to the responses of the model. Recent research on imitation has been directed toward discovering both types of influence that models have on children's behavior and the determinants of imitation in children.

Modeling Influences

Early research by Miller and Dollard (1941) and more recent work by Wilson (1958) and McDavid (1959) clearly established that the behavior of models can provide young children with relevant cues in problem-solving situations. For example, observation by the child of a model's responses, particularly when the child observes the model being rewarded, facilitates the solution of two-choice discrimination problems. Research by Bandura and his colleagues has shown that models also exert important influences in the transmission of large segments of socially significant behavior. For instance, Bandura, Ross, and Ross (1961) exposed a group of nursery school children to adult models who used toys and other objects in an aggressive manner. As compared to another group of children who observed models displaying inhibited, nonaggressive behavior, the experimental group produced significantly more aggressive play with toys and equipment in a posttest. The results of another study showed that exposure to human models on movie film and observation of cartoon characters both were as effective as living models in transmitting aggressive patterns of behavior to young children (Bandura, Ross, and Ross, 1963b). Some evidence exists that children's moral judgments can be altered as a consequence of observing models (Bandura and McDonald, 1963). On the other hand, little laboratory research has been conducted concerning the role of imitation in transmitting other classes of social responses, such as dependency, sex-typed behavior, anxiety, and achievement behavior.

Response Consequences to the Model

The extent to which the behavior of a model will influence the observer is at least partly contingent on the response consequences to the model. Bandura, Ross, and Ross (1963c) compared the amount of imitative aggression elicited in four groups of preschool children: one which observed an aggressive model who was punished for his aggression, one which observed an aggressive model rewarded, one which had no exposure to models, and one which observed highly expressive but nonaggressive models. The subjects who saw the aggressive model rewarded produced more aggression in a posttest than did subjects exposed to any of the other conditions. Those children who observed the model being punished for aggressive behavior did not differ from the control groups in amount of aggression shown on the posttest. Other studies indicate that models who are particularly competent or prestigious or who are perceived to have high status bring about more imitation than do other models (Gelfand, 1962; Bandura, Ross, and Ross, 1963a).

The studies by Bandura and his associates indicate that response consequences to the model influence a child's *performance* of an imitative response rather than his *acquisition* of the response. Children who observed a model being punished for aggressive behavior showed relatively little imitative aggression when tested immediately after observing the model and, further, indicated to the experimenter that they disliked and disapproved of the model's behavior. When offered attractive incentives to reproduce the model's behavior, however, these children demonstrated very convincingly that they were able to do so. Thus, watching the model being punished did not increase the amount of spontaneous aggression shown by the children, even though they had obviously *learned* the response patterns of the model during their observation.

Antecedents of Imitation

Research concerning the child rearing antecedents of imitation has been heavily influenced by psychoanalytic theory that suggests that, in some instances, the child is motivated to imitate, to identify with, the behavior of nurturant persons on whom the child is dependent. Psychoanalytic writers have postulated that in other instances identification occurs as a result of fear of punishment.

Several investigations have been designed to discover whether nurturant interaction between an adult and a child predisposes the child to imitate the adult. In a study by Bandura and Huston (1961), a female model behaved "nurturantly" to preschool children in one group and "coolly" toward subjects in a second group. Then the model exhibited a variety of novel motor and verbal behaviors and demonstrated the correct solution to a simple discrimination problem. The novel motor and verbal actions of the model were imitated more frequently by the nurtured children than by the non-nurtured children. On the other hand, nurturance by the model did not enhance imitation of the model's problem-solving behavior. Rosenblith (1959) investigated the effects of attentiveness and withdrawal of attentiveness on imitation by kindergarten children. Attentiveness seemed to enhance imitation, but the effect was confined primarily to girls. The relevance of nurturance to imitation in the child was discussed also by Sears (1957).

Ample evidence suggests that aggressive, punitive parents tend to have aggressive children. This evidence indirectly supports the hypothesis that imitation in children is based on fear of punishment. On the other hand, results cited above (Bandura, Ross, and Ross, 1963c) indicate that young children readily imitated aggressive behavior even though they themselves were not threatened by the model. It is possible that imitation is motivated by anxiety in some instances, but further research needs to be done to clarify the role of punishment as a determinant of imitative behavior.

One other theory of identification suggests that particularly powerful models (i.e., persons in the child's environment who are primary sources of both rewards and punishments) will be selected for imitation. For example, Mussen and Distler (1959) found that kindergarten boys who evidenced a high degree of masculine role identification, as compared with less strongly identified boys, depicted the father in a projective test as a relatively powerful source of both rewards and punishments. Also, Bandura, Ross, and Ross (1963a) reported that nursery school children tended to imitate adult models who possessed rewarding power more than they imitated (a) models who competed with the child for desired rewards or (b) models who neither controlled reinforcement nor competed for it.

The studies reviewed in the final section of this chapter clearly indicate the significance of imitative processes in the socialization of the child. Obviously, the determinants of imitative behavior in children are varied and complex. Developments in research and theory have been rapid, however, and increasingly precise predictions concerning imitative phenomena should be possible in the years immediately ahead.

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CHAPTER IV

Teacher-Pupil Interaction

EDMUND AMIDON and ANITA SIMON

Since the early 1950's, a number of researchers have focused their attention on teacher-pupil interaction in the classroom. Bales (1950), an early observer of small-group interaction, described interaction as resulting when two or more persons behave overtly toward one another so that each receives some impression or perception of the other distinct enough to incur reaction. The studies reviewed in this chapter utilized observational data to measure the overt behavior of pupils and teachers as they interact. This chapter will present a brief description of some systems currently used to collect and categorize observational data involving teacher-pupil interaction and then will summarize research related to the following areas: teaching patterns; achievement; climate, perception, and personality; and teacher education.

Systems for Observing Teacher-Pupil Interaction

Some of the systems that attempt to categorize teacher-pupil interaction are concerned primarily with intellectual activity in the classroom, some focus upon social-emotional behavior, and others are multidimensional. The systems described below are grouped in these three divisions: cognitive, affective, and multidimensional.

These systems—those briefly described and those listed as additional references—are the major systems currently in use to categorize teacher-pupil behavior directly or from taped classroom conversation. Some of these systems have been used only in secondary school classrooms.

Cognitive Systems

The system developed by Bellack and others (1963) contains three major categories: (a) pedagogical moves, which are classified as structuring, soliciting, responding, and reacting; (b) content analysis, which contains subcategories of substantive, substantive-logical, instructional, and instructional-logical meanings; and (c) emotional meanings, defined in terms of valence, potency, and activity. Gallagher and Aschner (1963) and Aschner (1963) used a system containing four major categories for classifying thought processes: cognitive memory, convergent thinking, divergent thinking, and evaluative thinking. An additional category is called routine. Taba and others (1964) developed a system that has two basic categories: One deals with the pedagogical function of a thought unit, which can be either psychological or strategic; the other concerns levels of thought, which include grouping and labeling, interpreting and making inferences, and predicting consequences. Each of these has subheadings.

Affective Systems

Withall (1949) developed a system which contains seven categories for teacher statements: learner-supportive, acceptant, problem-structuring, neutral, direction, reproving, and self-supporting. Flanders (Amidon and Flanders, 1963) developed a system containing seven categories for teacher talk: accepts feelings, praises, accepts ideas, questions, lectures, gives direction, and criticizes. In addition, it contains two categories for pupil talk: student talk-responding and student talk-initiation. Another category notes silence or confusion. A system developed by Hughes (1963) divided teacher behavior into these seven functions: controlling, imposition, facilitating, developing content, response, positive affectivity, and negative affectivity.

Multidimensional Systems

The Observation Schedule and Record (*OScAR*) developed by Medley and Mitzel (1958, 1963) is a comprehensive system for cataloguing teacher-pupil interaction, class structure, and classroom activities and materials. The three major dimensions of the system are emotional climate, verbal emphasis, and social organization.

Additional References: Kohn (1963); Oliver and Shaver (1962); Smith and others (1962); Wright (1960).

Teaching Patterns

Bellack and others (1963) presented a creative description of how teachers and students interact, characterizing the rules of the "classroom game." For example, a rule for teachers is that "the teacher will be the single most active person playing the game." A rule for pupils is "the pupil's primary task in the game is to respond to the teacher's solicitations." Bellack and his associates, using their category system, found in their study of 15 high school social studies teachers that the two most common patterns of classroom discourse, making up nearly 50 percent of the interaction, were (a) teacher solicitation—student response and (b) teacher solicitation—student response—teacher reaction. Although the study was done on the secondary level, it is relevant for elementary schools. Their system is extremely sophisticated, and the classification of verbal interaction requires that observers study and classify a typescript made from a tape recording. Classifying emotional qualities from a printed typescript is difficult because there is little opportunity to take account of the effect of intonation and other cues on the affective climate of the classroom. Therefore, in order to classify emotional tone. Bellack found it necessary to play the tape recordings collected in the study to a separate group of high school students whose reaction was then used to rate the emotional tone of the tape-recorded classes.

Giammatteo (1963), using Flanders' system, studied 150 elementary school teachers during language arts periods. He found that teachers accounted for more than 50 percent of the talk in the classroom and that most student talk was in response to teachers' questions. Although a large number of teachers were included, each teacher was observed for only 45 minutes. Using supervisory ratings as a criterion of teaching excellence, Amidon and Giammatteo (1965) compared the interaction patterns of 30 "superior" teachers with 150 randomly selected teachers in 11 elementary school districts. Using Flanders' categories, they found that superior teachers talked less, accepted more student ideas, encouraged more pupil-initiated participation, and gave fewer directions than did average teachers. The lack of reliability of supervisory ratings calls into question their criteria for superior teaching.

Using her own system of categorization, Hughes (1959) found in a study of 41 elementary school teachers that the median proportion of "controlling" acts was 46 percent. She also concluded that over 80 percent of the teachers studied were dominative in over half of the acts they performed. Control was the major function used, and simple memory-recall was the most common mental activity solicited by teachers. The teachers evaluated their students positively more often than negatively, but gave students criteria for evaluations less than half of the time. There appears to be opportunity for error in Hughes's study because the observers attempted to write down everything that happened in the classroom and to classify this later, using typescripts made from their notes. While Hughes stated that her intention was to describe teacher functions, she appeared to have built into her description "good" and "bad" values. Categories such as controlling, imposing, and negative affectivity, for instance, were discussed as if they were bad.

Much of the work on teacher-pupil interaction patterns has been done by Flanders (1960) and his associates (Amidon and Flanders, 1963; Flanders and Amidon, 1962). Although the major portion of the data was collected in the seventh and eighth grades, the results are relevant for elementary schools and are consistent with those reported by Giammatteo, Hughes, and Bellack. Perhaps these results are best summarized by Flanders' rule of two-thirds: in the average classroom someone is talking two-thirds of the time; two-thirds of this is teacher talk; and two-thirds of teacher talk consists of direct influence (lecture, direction giving, or criticism). Perhaps the greatest limitation found in research using Flanders' system was the lack of emphasis upon specific cognitive aspects of classroom interaction.

The studies reviewed in this section are significant because they describe what Bellack referred to as "the rules of the game." Apparently teachers and pupils follow common patterns in their classrooms which can be described and classified and which seem to indicate generally that classrooms are predominantly controlled by dominative teacher behavior.

Additional References: Brown (1961); Miller (1964).

Achievement

Amidon and Flanders (1961), using the Flanders system, conducted a study in which 54 eighth grade classes were taught geometry in a two-hour period by a teacher using either direct influence (lecture, direction giving, or criticism) or indirect influence (accept student ideas and feelings, praise, or question). They found that dependent-prone students learned significantly more from indirect teaching. In a more extensive study, Flanders (1960) found that seventh and eighth grade students in social studies and geometry learned significantly more when their teachers were indirect rather than direct. Above-average student participation, above-average acceptance of student ideas, and below-average teacher talk were associated with higher achievement. Schantz (1963), using Flanders' categories, tested the effect of indirect and direct teaching on high and low ability children in fourth grade science lessons. She found that the high ability group exposed to indirect teacher influence scored significantly higher on a science test at the end of the experiment than did the high ability group exposed to direct teacher influence.

Spaulding (1963) tested a hypothesis suggested by Bush (1954) which theorized that content-oriented teachers would produce above-average achievement in reading and arithmetic. Using his own system, Spaulding observed 21 elementary school teachers, but his data did not support the Bush hypothesis. Taba (1964) trained 20 elementary teachers to raise the level of thought processes used by their pupils. Using her own category system, she found that some children of low IQ performed on the same high level of abstraction with the same frequency of participation as did some children of high IQ when their teachers used appropriate strategies. Taba also found that children whose teachers were trained to use appropriate strategies gained significantly in ability to make inferences. She reported low correlations between level of thought used by pupils and any of the variables traditionally thought to influence the ability to abstract: intelligence, reading comprehension, achievement in social studies, and social status.

In a study of 12 intellectually superior classes, Gallagher and Aschner (1963) attempted to relate the type of teacher questions to the production of divergent thinking on the part of pupils. Five consecutive classroom sessions were tape recorded. Using her categories for classifying thinking, Aschner found, in general, that when the percentage of divergent questions from the teacher was high, the percentage of divergent thinking production from children was also high. Conversely, when the percentage of divergent questions was low, divergent thinking produced by the children was also low. Boys tended to do more divergent thinking than girls.

Additional References: Christensen (1960); Gordon and Adler (1963); Heil and Washburne (1962); Mastin (1963); Medley and Mitzel (1959).

Climate, Perception, and Personality

Morse, Bloom, and Dunn (1961) attempted to determine the relationships among pupil perception, teacher perception, and the perception of trained outside observers of four dimensions of classroom activity: development, mental health, group processes, and achievement. The observers used a rating scale developed by Morse to describe interaction in 30 classrooms in grades 5, 8, and 9. In general, if pupils rated one dimension high, they tended to rate all dimensions high; if they rated one dimension low, they rated all low. This was likewise true for the trained observers, who also saw the fours areas as compatible. On the other hand, teachers tended to rate the dimensions on an either-or basis. If teachers rated their classes high in achievement, they tended to rate them low in the other three dimensions. The authors also found that observers and pupils tended to agree on their ratings of the achievement dimension, while the teachers' perceptions correlated negatively with both.

Ryans (1960), in a study involving a large number of elementary and secondary schools, found that his three dimensions of teacher behavior (friendly versus aloof, businesslike versus slipshod, and stimulating versus dull) yielded high intercorrelations in elementary school teaching but low intercorrelations in secondary school teaching. Ryans' observers used rating scales that were similar to those used by Morse. His findings in the elementary school tended to support those of Morse, that an observer perceives certain teaching dimensions as interrelated; however, his secondary school findings did not support those of Morse. Flanders (1959), in a series of studies spanning 10 years, attempted to relate pupil attitudes as measured by a climate index to teacher influence patterns as identified by trained observers using the Flanders system. The studies, carried out in elementary and secondary schools in the United States and New Zealand, indicated that a positive social-emotional climate tended to be associated with indirect teacher influence.

Travers and others (1961), utilizing two large samples of elementary school teachers, attempted to relate teacher needs to teacher behavior. The four dimensions of needs (achievement, affiliation, recognition, and control), as identified by a projective instrument, appeared to be unrelated to the overt behavior of teachers as recorded by observers using the Withall categories. However, teachers' "need" to control, as measured by a paper-and-pencil test, the *Teacher Preference Schedule*, was significantly related to teacher controlling behavior in the classroom. Bowers and Soar (1961), using the *Minnesota Multiphasic Personality Inventory* (*MMPI*) as a measure of teacher personality, attempted to relate patterns of teacher personality to patterns of observed teacher behavior as indicated by the *OScAR*. They found the highest relationships between the psychopathic deviate (Pd), schizophrenic (Sc) and hysteria (Hy) scales of the *MMPI* and the *OScAR* dimensions of emotional climate, verbal emphasis, and social structure. Bowers and Soar concluded that teachers who (a) lacked maturity, depth of affect, and ability to feel personal loyalties (high Pd) and (b) were constrained, cold, remote, and inaccessible (high Sc) were less likely to have supportive emotional climates, extensive pupil-pupil interaction, or any great amount of pupil group work in their classrooms. Medley (1961), in a study in which he used the *MMPI*, found that teachers who had positive pupil-teacher rapport as indicated by high *Minnesota Teacher Attitude Inventory* (*MTAI*) scores tended to score high on the Hy and Pd scales, while low *MTAI* scorers were highest most frequently on the hypochondriasis (Hs) and depression (D) scales. There appears to be no consistent pattern of relationships in these three studies between the variables of teacher personality and teacher behavior. Lewin's (1951) theoretical analysis of the relationship between personality and behavior would lead one to expect a rather predictable relationship between these two variables. A theoretical analysis combined with an empirical investigation may be necessary to account for apparent contradictions.

Additional References: Bowers and Soar (1962); Gnagey (1960); Keislar and McNeil (1959); Kounin, Gump, and Ryans (1961); Wallen and Wodtke (1963).

Teacher Education

Schueler, Gold, and Mitzel (1962) pointed out that the variable of emotional climate could be categorized and identified by a trained observer. Using the *OScAR*, they observed three groups of elementary school student teachers and found that the variable most clearly related to the overt teaching behavior of student teachers was that of the classroom, which apparently is made up of components of classroom culture and cooperating teacher. They found that the variable of college supervisor of student teachers had little identifiable effect on student teaching behavior. Wilk and Edson (1962, 1963), in an attempt to relate predictor variables, such as scores on the *MTAI*, *MMPI*, and *Miller Analogies Test*, and counselors' judgments based on interviews with 30 prospective elementary education students, found high relationships between high *MTAI* scores and integrative teaching behavior as measured by the Flanders system and the *OScAR*. They did not find a high relationship between low *MTAI* scores and dominative student teacher influence. Wilk and Edson found that counselors were not able to identify students who later exhibited integrative student teaching behavior on the basis of an interview and admissions data.

Kirk (1964) found that the teaching patterns of elementary school student teachers who had been taught the Flanders system could be changed. These student teachers encouraged more pupil-initiated talk, reduced the amount of patterning involving teacher question and pupil response, and resisted the normal trend to increase the number of directions given to a significantly greater extent than did student teachers not taught the system. Kirk concluded that this difference was accounted for by the objective feedback which the Flanders system provided. Gage (1963) studied the effect of feedback on teachers and indicated that feedback may be the crucial element in an in-service training program designed to change teachers' classroom behavior. Taba and others (1964) suggested that as teachers begin to receive feedback about their teaching strategies, they will have the opportunity to modify their teaching habits.

Additional References: Flanders (1962); Flanders and others (1963); Storlie (1962); Waimon (1962).

Conclusions and Needed Research

Within school classrooms there appeared to be definite patterns of teacher-pupil interaction which could be objectively observed and categorized. These patterns were apparently related to achievement, perception, and classroom climate. While there also appeared to be a relationship between teacher personality and teacher-pupil interaction patterns, there seemed to be uncertainties about the exact nature of this relationship. Perhaps additional theoretically oriented research on teacher behavior and teacher personality would help to clarify some of the relationships between teacher characteristics and teaching outcomes.

The application of teacher-pupil interaction research in teacher education programs appears to hold great promise for the improvement of education. The feedback provided by these observational systems seems to have significant influence on the behavior and attitudes of teachers. However, much additional research is needed to determine the ultimate place of observational systems in the field of teacher education.

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CHAPTER V

Education for Disadvantaged Groups

CYNTHIA P. DEUTSCH *

In recent years, considerable attention has been focused on the stimulation and development of cognitive processes. Within this area, a most important subarea has been evaluation of the varying etiologies of defective intellectual performance. The work done here has led to a much more sophisticated view of mental retardation and of poor academic performance than that which previously existed. There have been many studies of the learning process and of concept formation in retardates, aiming to define relevant variables. Observed results from these studies are related to cohesive bodies of theory, such as Piaget's, rather than left to languish in the specialized literature of mental retardation. The over-all effect of this work has been to bring the area of mental retardation much deeper into the educational and psychological mainstream.

Review of the literature for the past period supports a generalization that the emphasis has shifted from the classification of mental deficiency and a concern with institutional organization and community services to a greater concern with interventional and educational programs in order to minimize the effects of retardation. More and more, the retarded are being studied in terms of the abilities and skills that they have and that can be developed, rather than in terms of those that they apparently lack. Both these recent emphases—on cognitive processes on the one hand and on present rather than absent skills on the other—have led to greater interest in educational programming for the retarded. Recent literature, both research and theoretical, reflects these emphases.

Foremost among the etiologies of retardation receiving greater emphasis is that of environmental deprivation. An early article by Benton (1956) deserves mention here as being one of the first in the recent period to present a cohesive approach to environmental determinants in retardation. Though the term Benton used, *pseudofeeblemindedness*, has fallen into disuse, and though his emphasis was still on the interaction of emotional and cultural status with what he termed the "basic hereditary factor," the approach exemplified in that article can be considered the transitional one. Following that time, and as a result of greater scientific and social concerns with the portion of our population labeled disadvantaged or deprived, there has been a growing interest in evaluating the effects of environmental conditions on mental functioning. The emphasis here has been both in terms of identifying the socially deprived and retarded (e.g., Jensen, 1961) and in terms of a more global evaluation of the effects on intellectual performance of disadvantageous environments. (e.g., John, 1963; Deutsch, 1963), leading to attempts to reverse the effects of environmental deprivation. These active and proposed intervention programs parallel the educational attempts directed toward improving the active skills and awakening the latent skills in children and adults whose retardation stems from neurological inadequacy.

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With the increase in the range of specialties concerned with problems of mental deficiency, there has been a corresponding increase in the number of books and articles published. The literature in mental retardation is voluminous and disparate. As a result, no review of it is included here. Instead, only a few of the current books are mentioned; the literature on educational programs for the socially disadvantaged is covered more extensively, though by no means exhaustively.

The Mentally Retarded

The monumental work of the past six years in the field of mental retardation, and the book that probably has most influenced the development of the field, is *Mental Subnormality* by Masland, Sarason, and Gladwin (1958). The authors reported a survey of the field of mental subnormality and divided the book into two major parts: the section by Masland dealt with research into biological factors in retardation; the other, by Sarason and Gladwin, treated environmental and cultural research. The authors did not regard biological and environmental factors as actually distinct but as separate yet interacting etiologies. They also made explicit their attack on what they term a *shibboleth:* the idea of "a hereditary taint as the basis for all mental subnormality" (p. 6). Their approach fosters educational programs; they assumed that retardates *can* be taught.

Among more recent books is *Handbook of Mental Deficiency*, edited by Ellis (1963). The distribution of chapters reflects many of the continuing concerns in the mental retardation field (e.g., perceptual processes, intelligence, and brain damage); also included are some which represent departures (e.g., the application of Piaget's theory to research on mental deficiency, research on activity level). Important omissions are the effects of social deprivation and contributions of psychology to educational programming. In *Mental Retardation*, Rothstein (1961) presented a broad range of chapters, in many of which are described or discussed educational programs and techniques for the mentally retarded. *Educating Exceptional Children*, by Kirk (1962), a book which is particularly relevant, includes a survey of educational practices for a wide variety of exceptional children, including the gifted, the physically handicapped, and the emotionally disturbed as well as the retarded.

The Socially Disadvantaged

The concern with the socially disadvantaged as a specific educational grouping and as a specific educational problem is relatively recent. This interest has been fostered by the increasing urbanization of our population and by the awareness of stratification and differential privilege within our society. Henry (1963) pointed out that the middle class home contains a "hidden curriculum" which enables the child to deal appropriately with his first school experience. The disadvantaged home contains no such curriculum and, as pointed out by Deutsch (1964a), represents a discontinuity with the school environment. Since the urban slum school also is more crowded and experiences greater turnover of both pupils and personnel than does the middle class neighborhood school, researchers in the area have been led to deal with school organizations as well as with the learning and response of the individual child. Further, since urban slum inhabitants include a high percentage of people from minority group backgrounds, desegregation and integration have become intertwined in the considerations of educational programs for the socially disadvantaged.

Two general books that have contributed a great deal to the considerations of educating the socially disadvantaged are *Intelligence and Experience* by Hunt (1961) and *The Process of Education* by Bruner (1960). Hunt explored a great number of tacit assumptions about the immutability of intelligence. With a thorough review of Piaget's concepts buttressed by implications from animal studies and a review of pertinent child development research, Hunt attempted to establish the prime influence of experience in the development of intelligence. This concept of the influence of experience underlies the institution of special educational programs for children from the slums, who are subjected to experiential deprivation of varying degrees. Bruner supported special programs by emphasizing the "teachability" of almost all knowledge, if the correct approach is used. Bloom (1964) further emphasized the mutability of intellective as well as other characteristics of the child.

Education in Depressed Areas, edited by Passow (1963), deals directly with many different aspects of the problem of the education of the disadvantaged child. Chapters by different authors are divided into sections on "Schools in Depressed Areas," "Psychological Aspects of Education in Depressed Areas," "Sociological Aspects of Education in Depressed Areas," "Teachers, for Depressed Areas," and "School Programs in Depressed Areas." The book includes a substantial bibliography.

The emphasis in *The School Dropout*, edited by Schreiber (1964), is on the children that the school loses. This book, which is a collection of articles by different writers, is divided into "Societal Factors" and "Implications for School Programs."

Questions concerning integration are discussed in *Integrating the Urban School*, edited by Klopf and Laster (1963). While the papers included in the book refer specifically to the problems in the New York City schools, the issues discussed are probably generalizable to any urban community.

The implication of the material in the books discussed so far is that, with proper educational planning, the deficiencies of the children from disadvantaged circumstances can be overcome. The emphasis has been on early compensation for the deficiencies in home environment. Riessman (1962) argued, however, that the disadvantaged are poorly prepared in a relative sense only and that educational programs can be begun at any age. Such programs, according to Riessman, should start with the real strengths that disadvantaged children possess in nonverbal communication and independence and should not rely on the middle class model. However, Riessman's argument on cultural relativism does not take into consideration the increasing industrialization of our society and the consequent greater dependence on verbal communication which leads to a greater need for facility in verbal skills such as reading and writing.

Relationship of Social Conditions to Intellectual and Language Development

John (1963) reported that "consistent class differences in language skills were shown to emerge between groups of Negro children of different socioeconomic class." Middle class children—children from more advantaged environments—were reported to have a better command of language in terms of its classificatory and problem-solving functions. The educational implication of these findings is for greater emphasis on language teaching for disadvantaged children, an implication supported in a study by Jensen (1963a). In studying different verbal learning tasks he found that paired-associate learning involved greater reliance on verbal mediators than did serial learning. His approach offers the possibility of a functional method of differentiating the socially disadvantaged from those children who are retarded as a result of other etiological factors. According to John (1963) and Bernstein (1960, 1962), the socially disadvantaged were less facile in the use of verbal mediators. The above studies open the problem of verbal mediation to both the diagnostic problems in low IQ findings and the educational problems in attempting to reverse the effects of environmental (linguistic) deprivation. The work of Kendler (1963), among others, is pertinent here.

Intelligence tests are known to be subject to linguistic and other environmentally determined factors. Deutsch and Brown (1964) attempted to determine the aspects of environment which contribute to lowering IQ. In a sample of 281 first and fifth grade children divided into groups on the basis of race and social class, they found that children from fatherless homes scored lower on the Lorge-Thorndike IQ test than did children from homes in which the father was present. Children who had had no preschool experience also scored lower than did children with preschool experience. The data they reported are the first from an extensive study of intellective and verbal factors related to socioeconomic status, race, and other individual and demographic factors. When the remainder of the study is published, researchers should have considerably more information and, simultaneously, considerably more problems to investigate.

Klineberg (1963) reviewed some old and some recent studies of the relationship between environment and intelligence and came to a conclusion which is in agreement with that of Deutsch and Brown (1964), namely, that there is a "cumulative deficit" associated with disadvantaged environments. As so many other studies have shown, children who are exposed to disadvantageous environments are subject to decline in intelligence score. According to Deutsch and Brown, this decline is evident by the fifth grade of school.

Additional References: Goss (1961); Luria and Yudovitch (1959); Vygotsky (1962).

Educational Programming

The major emphasis in educational programming for disadvantaged children has been to initiate programs before the gap between these children and their more advantaged peers widens beyond reach. This emphasis has led to development of programs on the nursery school level. Nursery programs that are oriented toward the stimulation of cognitive development find general support in Fowler (1962) and in Jensen (1963b). Their psychological basis was specifically elaborated by Hunt (1964) and their usefulness explicitly posited by Deutsch (1964b). The emphases in both articles were (a) that the preschool years are important in building the basic skills which underlie cognitive development and (b) that the assumptions which have guided the use of these years for noncognitive play are themselves invalid and are particularly inappropriate for the education of children subjected to deprived circumstances.

In general support of the same conclusion were papers which dealt with inadequate stimulation of perceptual skills (Deutsch, 1964) and with inadequate linguistic skills (John and Goldstein, 1964). Both papers indicated that slum homes are deficient in the stimulation required for adequate development of discrimination and of language skills. The two areas were bridged by a discussion of the relationship between auditory discrimination and linguistic and reading functions.

It is too early to evaluate either the import of these theories and recommendations or the success of the programs which they have stimulated. The results of the preschool programs for retarded children discussed by Kirk (1958) and by Connor and Talbot (1964) would seem to indicate that the approach can be productive. Since a number of preschool programs for disadvantaged children are now under way, it must remain for the next issue of the REVIEW in this area to report and evaluate their success.

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CHAPTER VI

Reading Research and Instruction

JOANNA P. WILLIAMS

The present state of reading research differs greatly from that of 1958. Within this period there has been a renewal of interest in the theoretical analysis of the basic reading process, and recent contributions by psychologists and linguists have been of great influence in focusing interest on basic studies. Considerable attention is also being given to the development of new and efficient techniques of instruction, notably within the context of programed instruction. Certainly, not all recent research has been centered around these developments. However, because these trends are new, influential, and promising, this chapter will focus on them. Other reviews have been prepared by Carroll (1964), Holmes and Singer (1964), Russell and Fea (1963), and Silberman (1963).

The Nature of the Reading Process

A divide-and-conquer approach to the problem of reading instruction has been adopted recently. If components of the whole task can be isolated, they may prove more susceptible to study and, hopefully, may lead to better methods of instruction.

It is fairly generally agreed that the reading process can be divided into two distinct stages (Carroll, 1964). The child must first learn that the symbols he sees on the printed page correspond in some way to his spoken language. The initial stage of reading consists of this decoding of orthography into already learned speech patterns. This ability is a necessary prerequisite to the second stage, in which the child actually comprehends the meaning of the message, since the meaning of the orthography is mediated by verbal responses, whether vocal or subvocal. Indeed, one might argue that the comprehension of a written message involves the same behaviors as does the comprehension of a spoken message and that this second stage is actually not a part of reading per se. In any event, the task of decoding is seen as the primary task of the reader.

Perceptual Learning

Gibson and others (1962a, b) suggested that before decoding can take place the child must learn to differentiate the written symbols, or graphemes, that he finds on the printed page. On the basis of a developmental study, Gibson concluded that certain features that differentiate among letters are also critical in object discrimination. The beginning reader has already learned these and can simply transfer them to the reading task. Other features are critical for differentiating between letters, but not for differentiating objects (e.g., rotations and reversals), and those are learned as children learn to read.

Gibson and others (1963) constructed a set of distinctive features of letters (e.g., whether the letter is symmetrical) such that each grapheme in the alphabet can be described uniquely in terms of these features. She predicted that the difficulty of discriminating any given pair of letters would depend on the number of distinctive features that the two letters shared. The relative difficulty of letter-pairs as reflected in the resulting confusion matrix was predicted quite well by her theoretical analysis. Popp (1964) reported findings in substantial agreement with the analysis of Gibson and others.

A recent experiment by Hendrickson and Muehl (1962) showed that pretraining that forced the child to attend to the directional differences between *b* and *d* facilitated learning names for those letters in a paired-associates task. These data suggest that training to focus on critical features (at least the reversal feature) will indeed facilitate discrimination.

One common recommendation of educators (e.g., Spalding and Spalding, 1957) is that training include some tracing or writing; the extra kinesthetic feedback presumably facilitates learning. However, the above mentioned study by Hendrickson and Muehl indicated that children who were trained to make consistent motor responses to each letter did no better at learning to discriminate the letter than those who made inconsistent motor responses to each letter. Other data also indicated that the addition of kinesthetic cues in training does not produce better performance (Otto, 1961; Ofman and Shaevitz, 1963). When some kind of kinesthetic training does make a difference, the effect is usually small or limited. For example, Levin, Watson, and Feldman (1964) found that tracing graphemes improved performance on a paired-associates task, but only when the initial grapheme was traced. Usually, a kinesthetic method is effective only with remedial readers, perhaps because it is a different kind of training from that in which they have already failed.

Decoding

The notion that the central task of reading involves learning the relationships between orthography and speech has, of course, led to the idea that it is crucial to gear instruction to the development of these grapheme-phoneme correspondences. This task is not so straightforward as it might seem: while English orthography is alphabetic in principle, there is a great deal of inconsistency, at least when simple grapheme-phoneme correspondences are considered.

Recent teaching systems developed by linguists recommend not only that instruction stress correspondences but also that the beginning reader be introduced only to regular and consistent correspondences. Only when one sound is well established as a response to a grapheme should another sound be introduced. Bloomfield and Barnhart's (1961) *Let's Read* presents the short sounds of all vowels first and does not introduce the long sounds until the short ones have been overlearned. Irregular spellings are classified "according to the various types of deviation from the alphabetic principle" and are presented systematically, after the regular correspondences are well learned. A similar approach was taken by Fries (1963), who stressed the development of basic and meaningful contrasts between spelling patterns in whole words (e.g., *man* versus *mean* versus *mane*). In fact, one of the most significant differences between these new linguistic methods and the older phonics methods is the extent to which the former stress regularity and consistency in the beginning of training.

Another way of providing consistent grapheme-phoneme correspondences for beginning readers has been studied recently. The Initial Teaching Alphabet (formerly called Augmented Roman and now usually referred to as *i.t.a.*) is an artificial orthography of 43 symbols, designed so that there is a one-to-one correspondence between sound and symbol. Preliminary data indicate that this modified orthography is a successful teaching medium. Downing (1964) reported that children who start with *i.t.a.* make significantly more rapid progress through a series of basal readers printed in *i.t.a.* than do pupils using comparable materials in traditional orthography. The important question, of course, concerns reading achievement in regular English after *i.t.a.* training. In a comparison of seven matched pairs of schools about 18 months after reading instruction was begun, Downing found that pupils who first learned with *i.t.a.* read significantly more accurately and with more comprehension than children who started with regular written English. According to the teachers' reports, spelling, after the transfer to English, was "no worse than usual." No mention was made, however, of the pupils' skill at writing regular orthography after learning *i.t.a.* Downing (1963) also reported data from a pilot study in which *i.t.a.* was used successfully in remedial instruction.

An artificial orthography similar to *i.t.a.* was developed by Sebesta (1964) and tested in a California first grade classroom. There were no differences between children who learned regular orthography from the beginning and those who started with the artificial orthography on the *Gates Primary Reading Tests* or on a test of familiar words; boys, but not girls, trained on the artificial orthography scored significantly higher on a test of unfamiliar words than did those trained on the regular orthography.

Levin and Watson (1963) have challenged the assumption that only regular grapheme-phoneme correspondences should be presented to beginning readers. They asked one group of third grade children to learn a list of four words in which a single grapheme was associated with a single phoneme (i.e., the correspondences were consistent). For a second group, one grapheme was associated with two phonemes (i.e., the correspondences were variable). The latter group, while taking longer to learn the initial list, learned a second variable list faster. Levin suggested that a "set for diversity" is developed through concurrent training and that this leads to facilitation of later association to that graphic stimulus. This study is representative of the current trend toward small-scale laboratory-type studies. Such work permits tests of the effectiveness of different teaching methods under controlled conditions.

The Critical Unit

Is it indeed a good assumption that training should focus on the correspondences between letters and phonemes? It has been argued that since the single letter does not have invariant acoustic match in English, it cannot be the appropriate unit to consider (Gibson and others, 1962b). Rather, letter *clusters* have invariant relationships with phonemic patterns and form the critical correspondences between written and spoken language; these are the functional and critical units. Even without specific training, according to Gibson and her colleagues, and even if an individual cannot formulate rules about the correspondences, he discovers them as he learns to read. In line with these ideas, they found that after tachistoscopic presentation, pseudowords that followed the rules of spelling-to-sound correlation were reproduced more accurately than those that did not. In another study, Gibson, Osser, and Pick (1963) found that children just starting to read seemed to have assimilated certain simple rules; they could read trigrams that fit such rules more accurately than trigrams that did not.

An important attack on the question of the nature of these correspondence rules was made by Weir (1964). On the basis of an analysis of spelling-to-sound relationships in 20,000 common words, Weir suggested that English spelling is related not only to phonology but also to morphology and syntax. Indeed, when these relationships are taken into account, there is a considerably greater amount of regularity between written and spoken English than when only simple letter-to-sound relationships are considered. Weir believes that the selection of words to be used in teaching should include some consideration of grapheme-to-morphophoneme patterns.

Lefevre (1964) was also concerned with the establishment of an appropriate unit to use in the development of instructional materials, but in a different way. In Lefevre's approach, the word itself is treated as a minor language unit. He believes that since words occur in groups within larger structural and meaning-bearing patterns, teaching should stress these larger structural patterns. Until data concerning the effectiveness of this approach are collected, it will not be possible to judge the value of what would seem to require more complex learnings of a beginning reader than do most current programs. In any case, Lefevre has developed the first linguistic method that actually draws heavily on the content of structural linguistics and does not stop with a restatement and reapplication of the alphabetic principle.

Comprehension

While current emphasis is on the decoding process, it is clear that there is a need to consider comprehension in one form or another within this context. Work to date indicates that the determination of the critical unit of correspondence will depend on analysis of syntactic and semantic as well as phonological structure.

Jones and Carterette (1963) have found that when given free choice, children prefer books that are less redundant (i.e., more difficult) than the graded readers they are offered in school. It should be noted that the free choices were usually books that the child would have read *to* him, not read on his own. Strickland (1962) found that oral language patterns are much more complex and flexible than patterns found in typical elementary readers. This and other work suggest that perhaps the construction of reading materials should be related more closely to the child's own language.

Programed Teaching Systems

Early programs often focused on the development of sight vocabulary, reflecting the then-prevalent whole-word methods of instruction (e.g., Stolurow, 1961). More recent programs used a phonics approach. Hopefully, the content of future programs will be based on some of the work previously cited; so far, there has been little integration of the two approaches.

A good example of the use of experimental analysis in the development of an instructional program is seen in Silberman's (1964) report of a program designed to teach first graders to sound out and to read trigram combinations. An initial program was constructed and administered to several pupils individually in a tutorial manner. Revisions of the program were developed on the basis of what seemed to be effective procedures in these sessions, and formal experimental comparison was made between the last revision and the original version of the program. Taped versions of the program were not as successful as were oral presentations by an experimenter. Silberman suggested that the experimenter may modify his pacing in response to subtle cues he gets from the subject.

Given the current emphasis on individualized instruction and on programed instruction, one would expect to see a great deal of effort devoted to adapting programed instruction to individual differences. Little work has been done in the area, partly because of technical complexities (Silberman, 1963). Most of the current research concerned with individual differences was conducted in the more traditional classroom setting (e.g., Balow, 1962; Grimes and Allinsmith, 1961; Preston, 1962).

The Age for Beginning Training

Many investigators using automated techniques and/or precisely programed training sequences have achieved success with children of an age below that at which instruction is typically begun (e.g., Staats and others, 1964; Moore, 1963). Others have worked with retarded children whose mental ages were below those of the typical beginner (see the February 1963 issue of the REVIEW, pp. 126-36). In fact, Fowler (1962) was able to teach at least some rudimentary reading skills to a two-year-old, using very flexible training techniques. In answer to the apprehension that many people have concerning possible deleterious effects of early training, Durkin (1961, 1963) concluded from two longitudinal studies that preschool reading does not in itself lead to problems when the child enters school. It is significant that in all of these successful attempts at teaching very young children, some form of individualized instruction was used.

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CHAPTER VII

Mathematics and Science Programs for the Elementary School Years

GLORIA F. LEIDERMAN

In the past five years, coincident with the accelerated development of new curricula in mathematics and science. there has emerged a heightened interest in learning and teaching of children's mathematical and scientific concepts. The primary efforts of many of the curriculum groups in their initial stages have been devoted to the preparation of materials and training of teachers. The point of view of major curriculum projects in elementary mathematics and science will be presented in this chapter, with some references to concept teaching and learning and a discussion of research needed.

Mathematics Programs

The pressures for new mathematics curricula stem from mathematics research leading to advances in such fields as topology, abstract algebra, and theory of games as well as from the automation revolution (Price, 1961). The contribution of mathematics to such diverse areas as space technology, genetics, physics, and business production and distribution was cited by Brown (1961) as necessitating an improvement in school mathematics.

Weaver and Gibb pointed out in the June 1964 issue of the REVIEW that although there has been an intense interest in "modern" mathematics during the past few years, no definitive research in the development of instructional media and programs has been reported.

School Mathematics Study Group

The main purpose of the School Mathematics Study Group (SMSG), as described by Begle (1958), is to develop curricula and teaching materials for all students based on the best available knowledge of mathematics, pedagogy, and the needs of our society. Since it is not possible to predict exactly what career any particular student will choose nor exactly what mathematics skills will be important in the future, it is assumed that teaching which emphasizes understanding, insight, and imagination without neglecting basic skills is best for all students.

The primary method of curriculum evaluation used by SMSG, as well as by many other projects, has been to try out materials in classrooms and revise these on the basis of teachers' reports and assessments. A testing program to measure mathematics achievement in fourth and fifth grade classes using SMSG *Mathematics for the Elementary School* was reported by Weaver (1963). Mean gains from fall to spring testing on the *SRA Achievement Series: Arithmetic* showed that these groups equaled or exceeded normally expected gains in terms of grade equivalents in both reasoning and computation scores. Tests were devised and administered to measure achievement in selected aspects of content emphasized in fourth and fifth grade SMSG texts. These test findings form the beginnings of normative data for SMSG materials. An Ideas and Preferences Inventory was used with this sample to measure attitudes toward arithmetic. Unfortunately, in this study there were no control classes using more traditional mathematics curricula for comparison of attitudes or achievement.

A study using paired experimental and control fourth grade classes was reported by the Minnesota National Laboratory (1963). The experimental classes were taught from SMSG texts; the control classes were taught from conventional texts. The test measured achievement in traditional arithmetic from fall to spring. Although the differences favored the experimental classes, no statistical tests of significance of difference were reported, nor were any tests given which might measure concept understanding, the major emphasis in SMSG texts.

The National Longitudinal Study of Mathematical Abilities (Cahen, 1963) began studying 122,000 fourth, seventh, and tenth grade students in 1962. This is a five-year study designed to measure students in both conventional and new mathematics curricula on such variables as attitudes toward mathematics, reasoning, analytic skills, and mathematics achievement. No findings have yet been published from this research.

University of Illinois Arithmetic Project

The University of Illinois Arithmetic Project, under the direction of David A. Page, has devised materials primarily to stimulate children's interest in mathematics and to allow them to pursue mathematics beyond the usual limits of elementary school arithmetic. The philosophy of this group, according to Hohn (1961), is that a creative approach to problem solving can be used at all ages to introduce significant mathematical concepts and methods of thought.

A description of the influence of this approach to teaching mathematics was based on experiences of the Project staff with experimental classes. Deans (1963) reported the belief of this group that considerably higher proficiency in computation can be attained, coincident with the introduction of new, genuine mathematical content. It is to be hoped that systematic studies will eventually be undertaken and published to support—or reject—this conclusion.

Additional Reference: Page (1962).

Madison Project

Davis (1963) specified four major activities by which the Madison Project has contributed to the rational guidance of educational change. The first activity consisted of trying out ideas, seeing how they work, and shaping plans which are in accord with the results of "thrusts and probes." Included among examples cited were teaching the arithmetic of signed numbers to first and second graders and allowing children in grades 4-7 to work with algebraic identities and proofs of algebraic theorems. A second activity has been to help administrators and teachers introduce new mathematics by providing them with books, films, and in-service courses. The third activity has been to devise creative mathematical experiences for children; the fourth, to work toward a theory of instruction. Since a primary aim of this project is to guide educational evolution, it would seem that this guidance should be based on some form of critical evaluation in addition to creative thought. In none of the publications of the Project which were reviewed, however, were there indications of what objective criteria were being used to evaluate the outcomes of any of the four categories of activities.

Additional Reference: Davis (1963).

Sets and Numbers Project

More systematic study of new mathematics materials has been made by Suppes and his collaborators than by any other group working in this area. Suppes and Hill (1963) stated that the intention of the Sets and Numbers Project is to provide a program that is mathematically sound and pedagogically simple, stressing structure and foundations. The central concept in the materials is that of a set, because this concept is basic to the development of the idea of a number. Operations on sets are introduced as fundamental to the parallel operations on numbers.

Suppes and McKnight (1961) analyzed errors made by four first grade classes on each chapter of the experimental workbook. On the basis of percent of errors made, certain topics were excluded from the curriculum materials to be tested the following year, and other topics were introduced earlier.

Suppes and Hill (1963) reported a comparison of first and second grade classes using these materials with matched control classes using a traditional program. Results indicated that on the arithmetic portion of the *Metropolitan Achievement Tests*, children using sets and numbers scored as well as, or better than, children scored in the traditional program. No tests were given to measure that content included in the experimental materials which was not measured by this standardized test.

Several studies of concept formation in young children were summarized by Suppes and Ginsberg (1962). These were well-controlled experiments lodged within a theoretical model. Some of the major findings were these: (a) learning was more efficient if the child, after making a mistake, was required to make a correct response in the presence of the stimulus to be learned; (b) incidental learning of mathematics was not effective; and (c) prior learning of one concept did not improve learning of a related concept.

Additional Reference: Suppes (1964).

Greater Cleveland Mathematics Program

The purpose of the Greater Cleveland Mathematics Program has been to develop a logical, systematic elementary and secondary curriculum that presents basic mathematical concepts before computational schemes (Deans, 1963). Extensive use has been made of the discovery approach to learning. The program has been experimental to the extent of trying out materials in a large number of classrooms and revising them on the basis of feedback from the teachers. No published reports of specific evaluation procedures were located.

Studies of Concepts Utilized in New Mathematics Programs

A few reports appeared in the literature evaluating, through small-scale studies, certain of the concepts utilized in various new mathematics curricula. Joyce and Joyce (1964) attempted to assess the effectiveness with which children could learn central ideas of certain SMSG units when their ability to perform concrete and formal operations—in the Piaget developmental sense—was controlled. The secondary purpose of this study was to explore the feasibility of cooperation between school districts and university personnel in undertaking small research projects on the effects and appropriateness of the new curricula for young children. The major findings of this study were that although the fifth grade class scored significantly lower than the sixth grade class on a test of formal reasoning prior to the SMSG, the two grades were not significantly different on this same test after the experimental units had been taught. Both classes made significant gains on a test designed to measure acquisition of the central concepts of the units.

Lerch (1963) reported the effect on two fourth grade classes of studying a number system with base five. He found a significant change in the experimental group's understanding of the decimal number system. Although he used two additional fourth grade classes as a control group, he did not test these children on understanding of the decimal number system at times equivalent to the pretests and posttests given the experimental classes.

The work of Dienes (1963) was concerned with the process of mathematics learning rather than with the learning of specific mathematical concepts. His five experimental groups were composed of children in grades 2-6. This work was based upon the theory that the learning of mathematical concepts, as well as other cognitive structures, is achieved through play. The book described the activities and complex games used in teaching certain mathematical ideas to experimental groups.

Science Programs

The task of bringing new knowledge to all students in ways appropriate to their interests, abilities, and future lives requires new strategy. This was the point of view expressed in the introduction to *Science Course Improvement Projects*, which described curriculum projects currently sponsored by the National Science Foundation (1964). In his recent review, Atkin (1964) pointed out two major threads in curricular revision. In one approach, the content of a particular discipline is the source of innovation; in the other approach, a model of children's thinking ability serves as the focus. In addition to reviewing studies on curricular developments, Atkin reviewed studies of instructional materials and of children's scientific concepts.

Science Curriculum Improvement Study

The philosophy of the Science Curriculum Improvement Study, as stated by Karplus (1962), is that the function of elementary education is to guide the conceptual development of children by providing them with particularly informative and suggestive experiences as a base for their abstractions. At the same time, children must be provided with a conceptual framework that permits them to perceive the phenomena in a meaningful way and to integrate their inferences into generalizations of lasting value. The testing of specific experimental units in the elementary grades was described, and evaluation of pupils' learning was discussed.

More recently, the study has been concerned with describing lessons and methods which combine discovery with expository introduction of concepts by the teacher (Atkin and Karplus, 1962; Karplus, 1963; Thier, Powell, and Karplus, 1963). This project is of interest because of its attempt to develop a concept of science education based on the development of children's thinking, utilizing discovery within a framework of conceptual presentation.

University of California Elementary School Science Project

The major activity of the University of California Elementary School Science Project has been to develop units of study in various areas of science, making use of contributions to elementary science education by scientists at the University of California. Much reliance has been placed on experimentation by the children in demonstrating both scientific method and the contributions science makes to understanding.

Methods of evaluating units of instruction during the first two years of the Project's work were reported by Scott (1962). The data collected were subjective reports from teachers of pilot classes; subjective reports from Project members who observed the instruction in the pilot classes; subjective reports from parents, school officials, and observers; and results from objective group tests prepared by the evaluator for appraising the learning of pilot-class children. Findings were presented both on individual units and total Project activity. These findings suggested a relationship between intelligence and the understanding of abstract concepts and the importance for effective teaching of the teacher's understanding of concepts. This report, however, summarized the findings without presenting any systematic data or analyses.

Illinois Elementary-School Science Project

The emphasis of the Illinois Elementary-School Science Project has been on teaching concepts of astronomy to elementary school children. The work of the early phase of this program was reported by Atkin (1961) and reviewed by him in the June 1964 issue of the REVIEW.

Problems of curricular evaluation, within the context of the Project, were delineated by Atkin (1963), and the kinds of evaluation information gathered by the Project were enumerated. Other investigations of these astronomy materials were reported by Pierce (1963). One study concerns effects on motivation when children are made aware of the conceptual framework of instructional materials as compared to motivation in a situation in which the conceptual interconnections are less obvious and the child investigates for the sake of investigation.

Commission on Science Education

The primary focus of materials developed by the Commission on Science Education of the American Association for the Advancement of Science was the construction of a set of activities which were expected to have a high probability of shaping those behaviors common to all scientific endeavors: the processes of science. Walbesser (1963) described the evaluative techniques built into the new curriculum. The strategy consists of a three-phase approach: (a) the specification of curricular objectives as *behaviors*, (b) the measurement of each of these specified behaviors by means of a check list of competencies, and (c) the measurement of behaviors that characterize the processes of science.

Combined Science and Mathematics Programs

The primary aim of the Minnesota Mathematics and Science Teaching Project is to produce a coordinated science and mathematics curriculum for kindergarten through grade 9 (Rosenbloom, 1963). Research plans involve short-term evaluation of curricular materials for revision purposes. More rigorous evaluation will be undertaken when students graduate from the experimental preservice program. In addition, basic research in cognitive processes is to be undertaken.

Conclusions: Evaluation and Research

While the great intellectual and technological advances of recent years have had their impact on curricular change, they have not had an equivalent impact on educational research. Although reports on objectives, activities, and materials abound in educational research publications, these reports have failed to include such significant information as the names of tests or evaluative instruments used, the tabulation of the data collected, and the kinds of analyses from which conclusions were drawn. While systematic procedures may have been used for revising materials in many projects, the actual evaluations do not appear in the literature. However, this does not imply that evaluation in some form has been lacking. As Mayor (1962) pointed out, all of the projects engaged in the development of new course materials for mathematics at the elementary and junior high school level have provided for classroom tryouts, reports from teachers who have used the materials, and modification based on these reports. Mayor suggested that while this research has not been well controlled in most instances, it does represent a new and important kind of research in mathematics education.

The problems of evaluation are currently receiving considerable attention. The papers of Atkin (1963) and Walbesser (1963) presented very different positions on the methods and goals of curriculum evaluation. A clear statement defining the role evaluation can play in course improvement activities was made by Cronbach (1963). According to Cronbach, the greatest service evaluation can perform is to identify aspects of the course in which revision is desirable. He did express the hope that evaluative studies will go beyond reporting on particular courses and contribute to a general understanding of classroom learning.

Research Problems in Mathematics Education (U.S. Department of Health, Education, and Welfare, Office of Education, 1960) delineated problem areas for future research. The major emphasis in these problem areas was the learning of mathematics and various factors related to it, such as perception, nonverbal awareness, and personality variables.

In his review of research pertinent to science instruction, Smith (1963) suggested that the important questions for research are these: Which concepts are most valuable in the further intellectual development of the child? Which concepts contribute most to the cognitive, affective, and social objectives of science instruction?

Because these programs are still relatively new, it is important to assess the influence of the novelty of these curricula on motivation and achievement. Another significant problem involves the level of verbal ability demanded by these science and mathematics programs. The most basic research area and the one that incorporates several of the specific problems enumerated is that of cognitive development. It is hoped that future research will contribute to this body of knowledge.

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This issue of the REVIEW was prepared by the
Committee on Adult Education

WILSON B. THIEDE, *Chairman*, University of Wisconsin, Madison, Wisconsin
GALE JENSEN, University of Michigan, Ann Arbor, Michigan
ALAN B. KNOX, University of Nebraska, Lincoln, Nebraska
JOSEPH MATTHEWS, Federal Extension Service, U.S. Department of Agriculture, Washington, D.C.

with the assistance of

ROBERT BARNES, Ohio State University, Columbus, Ohio
ROBERT BOYD, University of Wisconsin, Madison, Wisconsin
ROBERT C. CLARK, University of Wisconsin, Madison, Wisconsin
LINNEA B. HOLLAND, Federal Extension Service, U.S. Department of Agriculture, Washington, D.C.
BURTON W. KREITLOW, University of Wisconsin, Madison, Wisconsin
JINDRA KULICH, University of British Columbia, Vancouver, British Columbia, Canada
HOWARD MCCLUSKY, University of Michigan, Ann Arbor, Michigan
JOHN MEGGERS, University of Wisconsin, Madison, Wisconsin
EDWARD B. SASSE, University of Wisconsin, Madison, Wisconsin
ALBERT SCHRADER, University of Michigan, Ann Arbor, Michigan
COOLIE VERNER, University of British Columbia, Vancouver, British Columbia, Canada

FOREWORD

Research in problems of adult education has increased markedly, as has research about education in general. The developing maturity of the field suggests that topics such as learning, curriculum, administration, and philosophy be treated in the future in appropriate issues of the REVIEW rather than in a separate issue. Scholars in these fields will have to broaden their concerns and be certain that the field of adult education is included in their preview. The chapter organization of this issue reflects this recommendation.

Wilson B. Thiede, *Chairman*
Committee on Adult Education

CHAPTER I

The Adult Education Enterprise

ROBERT C. CLARK and EDWARD B. SASSE

The number of published research studies relating directly to the organization, management, staffing, and financing of institutions of adult education increased significantly during the past five years. A number of outstanding doctoral dissertations analyzed phases of adult education as developed through the public schools, libraries, cooperative extension services, university extension services, and related services. Research personnel identified with such disciplines as law, sociology, and economics chose to study problems in education that have a direct bearing on the organization, staffing, and financing of the adult program. Private research organizations and citizens committees were involved in an intensive assessment of specific adult education programs and have recommended significant changes in the enterprise.

The purpose of this chapter is to summarize selected studies which represent significant contributions to knowledge of the organization and administration of the adult education enterprise.

Johnstone (1963) prepared the first of a series of studies sponsored by the National Opinion Research Center about the nature of adult education in America. A probability sample of 13,293 households was drawn; information was obtained from 23,950 adults representing 11,957 of these households. Estimates of national totals were developed from these figures. Activities classified as educational were those in which the main purpose was to learn or acquire some type of knowledge, information, or skill and which was organized around some form of instruction. Johnstone estimated that 25 million Americans had been active in some form of adult education during the period from June 1, 1961, to May 31, 1962. Approximately one-third were engaged in self-organized programs of study. Most of the activities were primarily noncredit activities, with strong emphasis on general education, vocational subjects, religion, hobbies, and recreation. More than one-half of the courses were sponsored by churches and synagogues, colleges and universities, and community organizations. Governmental activity in adult education was concentrated in two major areas: (a) vocations and (b) home and family life. Since the typical participant was young and well educated and lived in an urban area, the author predicted that a tremendous adult education explosion will take place within the next decade, with emphasis on learning for work, learning for leisure, and liberal education.

Kreitlow (1964) conducted a study of the contributions of the research of selected disciplines to adult education and identified the research needs of the area. He combined an intensive review of the literature from eight subject matter areas with opinions obtained through interviews with 34 selected persons of national stature in some discipline related to adult education or the applied field. Kreitlow identified the eight major categories as adult education, business and industry, communications, psychology, sociology, social work, vocational education, and education. He concluded that the research needs in adult education fit into three categories of application: (a) the adult as an individual and a learner, (b) the adult's response to sociocultural phenomena, and (c) the adult education enterprise. The report included a classification system for research literature and a scheme of research needs in adult education.

Public Schools

Inroads into educational research by related disciplines are exemplified by the political scientists' "discovery" of the politics of education. Masters, Salisbury, and Eliot (1964) designed their three-state study to look at individuals, groups, and governmental agencies having a direct and tangible stake in the outcome of educational decisions, with the assumption that these would lead to the sources of power and would help to unmask the realities of political processes in this policy area. They concluded that the Illinois School Problem Commission was actually the arena in which decisions concerning the state's role in education were made, that the Missouri State Teachers Association held a virtual monopoly over the process of articulating the policy demands of the public school professional educators, and that Michigan had no group to represent the "best thinking possible to solve the state's educational problems." The authors recognized the limitations of their study and presented their findings as a posteriori for further research. It is hoped the study will bring the relationship between politics and education to the attention of political scientists, professional educators, and others.

Representative of the Syracuse Economics and Politics series was the work of Munger and Fenno (1962), which dealt with the struggle to secure general federal aid for education. Research data were gathered through a review of the voluminous public record and from interviews with individuals involved in the controversy.

The yearbook of the National Society for the Study of Education (1964) presented the developments that have occurred in educational administration since the end of World War II. Reflecting interpretation as well as description, the new concepts were discussed under the following perceived changes: (a) administration is susceptible to empirical research; (b) administrators in all organizations are confronted with a common set of tasks; and (c) administrators now view the human being in a different light. The text treated the background, present, and perspective bases of administration in all organizations in representing the research and combined thinking of the outstanding leaders in the field.

Libraries

Penland (1960, 1961) attempted to determine the image which public librarians have of the educational function of the public library and to decide whether attitudes held were strong enough to implement official educational objectives. Utilizing Guttman scaling techniques on 260 supervising librarians from 33 public libraries in Michigan, Penland found that the librarian is the key to the lack of commitment to adult education in American public libraries. He concluded that these librarians had not fully rationalized their position in adult education, that they showed some resistance to adult education, and that advances would be slow if left to the typical administrator.

Monroe (1963), in a study based on the analysis of historical documents of three nationally known libraries, searched for the meaning which adult library education held for librarians in the United States during the period 1920-55. Monroe found a history of alternating confusion and resolution, but believed that the major causes for confusion have passed and that role consensus would now allow librarians to bend their energies to the fulfillment of the libraries' responsibilities to adults.

International Research Associates (1963a, b), commissioned by the American Library Association, examined the scope and extent of limited access to public libraries in the United States with particular reference to the problems of racial segregation in Southern libraries. Main focus was on the following aspects: (a) the extent and pattern of segregation, (b) the rate of change toward segregation, (c) factors tending to retard or promote change, (d) the role of the law in the segregation of public libraries, and (e) the attitude of librarians and library boards toward segregation. The primary instrument of the study was a questionnaire mailed to all libraries in the United States. Supplementing this were interviews from a sample of 43 systems in 12 Southern states, a review of previous studies, and an analysis of the location and resources of branch libraries in 10 cities. The major conclusions were these: (a) direct discrimination was confined to 16 states, but indirect discrimination was found throughout the United States; (b) all forms of direct discrimination as well as state statutes requiring segregation were unconstitutional; (c) desegregation had proceeded faster in the library than in some other public facilities, partly because of efforts of professional librarians; and (d) the rate of library integration was affected by the low priority given it by Negro leaders. Criticism of the study was focused on aspects of indirect discrimination.

A study of the predominantly library-centered Great Books program was reported by Davis (1960) and by Davis and others (1961). This study utilized a national sample of 1,909 individuals in 172 discussion groups and was conducted through self-administered questionnaires under the direction of a National Opinion Research Center interviewer. The 1960 report covered a comprehensive description of the participant and the effects of participation. Findings showed respondents to be well-educated, socially active young adults of high status. The strongest and clearest effect of participation was increased knowledge of the liberal arts and humanities. The 1961 report concentrated on an exposition of factors that promote and factors that inhibit the retention of membership. Major conclusions stressed that program retention was extremely complicated, but that gratifications to members involved regularity of participation, social structure of the group, and initially strong interest and preparation.

The complexities and trends of financial support of libraries were discussed by Leland (1963), Drennan (1963), and Drennan, Kittle, and Winnick (1964). Leland concentrated on libraries in cities of medium size. His article showed the most important event affecting local revenues to be the increase of intergovernmental payments or transfers. He decried the lack of published statistics on sources and amounts of library revenue and identified this area as paramount in future research. Drennan reviewed the costs of library service and concluded that, although expenditures for public library purposes have increased greatly in the past two decades, the per capita cost of such operations has not increased to the same degree. Continued urbanization leads one to believe that public libraries will command larger total outlays from local governments. Drennan, Kittle, and Winnick reviewed the entire range of federal programs in operation or being planned to aid public libraries in the attack on poverty. Individual programs were briefly outlined, and implications for improved library service were drawn.

Cooperative Extension Services

The cooperative extension services throughout the nation have undergone more study and appraisal of their organization, program, personnel, and operations in recent years than during any previous period. Most of the studies and investigations have been carried out by academicians in adult education associated, to some degree, with the Cooperative Extension Service and by private research agencies.

A study of the Ohio Cooperative Extension Service was made by Fishel, Collings, and Wilhelmy (1964) through the Battelle Memorial Institute, an independent research group which applied the scientific method to an objective evaluation of the present and potential structure and functions of the Service. They concluded that (a) the Service provided a "wide variety of educational, informational, and specific services to adults and youth in both urban and rural areas" and that (b) "the most notable trend in clientele was the increased demand for a high level of specialized technical information by primary agricultural producers." The lack of a clear-cut definition of purpose and objectives was seen as an important underlying factor for many of the problems of the Service. Recommendations for suggested changes in the organization or operations were concerned with (a) appraising the purposes and objectives of the Service,

(b) creating a long-run plan of development, (c) maintaining the desired public image, (d) providing a more timely and specialized service, (e) initiating certain programs at the state level, (f) providing more specific and clear-cut policy guidelines to Service workers, (g) initiating experimental projects in different methods of communication and different structural arrangements that might improve operations, and (h) establishing a Continuing Education Extension Division of the University.

The *Report of the Century Council* by Texas A&M University (1962) was the culmination of approximately 14 months of study of the structure and programs of the University by a group of 100 outstanding citizens of Texas. The Council recommended that (a) consideration should be given to granting proper rank and status to qualified nonteaching personnel; (b) careful evaluation of both the need for and the costs of agricultural extension education programs should be made by the University on a continuing basis; (c) closer working relationships should be developed between extension education personnel in the agricultural sciences and research and instructional personnel; and (d) efforts should be made to modernize publications procedures, to write research reports in simpler language, and to develop the use of the mass media of communication for more widespread and effective dissemination of research findings to the public.

The image of cooperative extension, as seen by various clientele groups, has been studied by Abraham (1963), Blalock (1963), Cavender (1964), Greenwood (1963), Griffith (1961), and Kyd (1962).

Even though all university extension programs have made, and are continuing to make, significant and lasting contributions to the growth and development of the particular segment of society for which they are designed, clientele groups represented or reported on by these writers recommended a major re-examination of organizational structure, program services, professional competency of staff, and financial resources.

Factors associated with the coordination of extension programs with research and resident teaching functions in agriculture and home economics were the focus of research by Hyatt (1961) and Richert (1961). These two researchers agreed generally that the major factors influencing the coordination of research, teaching, and extension services included the following: (a) historical background of land-grant institutions, particularly colleges of agriculture and home economics; (b) philosophy of current administrative leadership toward coordination; (c) departmental identification of subject matter specialists, with particular reference to policies concerning employment, location of office, program supervision, budgeting, academic rank, joint appointments, and determination of salaries; and (d) joint departmental staff planning and evaluation of programs.

University Extension Services

Two reports by Carey (1961a, b) for the Center for the Study of Liberal Education for Adults were designed to bring new and significant research in the field of university adult education to the attention of administrators of adult programs, educational researchers, and others. Classified as a qualitative case study approach emphasizing the gathering of data of a quasiclinical nature, one study (Carey, 1961a) dealt with the emergence of university evening colleges, the historical circumstances under which this university service developed, the dynamics of evening school operation, and the social relationships that permeate the performance of the task of the evening school. Carey concluded that the evolution of university extension services had required a coincidence of men with vision, adults with unfilled aspirations, and a university ready to meet the challenge. A second study (Carey, 1961b), based on a questionnaire survey and intensive interview in 18 institutions, was concerned with forms and forces in university adult education. This research pointed up the need for closer integration of the university's community aim with its central purposes.

Related Services

Schwartz (1963) traced the evolution of nonmilitary education in the U.S. Army and Air Force from 1900 to 1960, with emphasis on 1948-60. Using data obtained from official records and documents, he found that educational progress was of little consequence prior to World War I. Economy measures in 1923 strongly de-emphasized education; this pattern continued until World War II. Extensive educational programs emerged and were made an adjunct of military life. Schwartz reported further that both services showed a continued trend for expanded programs based on the following assumptions: (a) morale would be improved; (b) boredom would be minimized, resulting in fewer discipline problems; (c) recruitment would be facilitated; (d) the increasingly complex military structure demanded better educated and trained personnel; and (e) a well-informed serviceman would be a better fighting man.

A study by Clark and Sloan (1964) was the third of a series concerning education outside conventional institutions of learning. Comprehensive in scope, it depicted the Armed Forces educational program as indicative of a universal trend toward education in nonacademic channels. The authors concluded that education in the U.S. Armed Forces was in the vanguard of our present technological revolution, with extensive research, effective education, and extraordinary technology.

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CHAPTER II

Programming

COOLIE VERNER and JINDRA KULICH

This chapter is concerned with the design and management of instructional situations in adult education. A number of recent reviews have been made, notably the important and exhaustive review of research on liberal adult education by Brunner and others (1959). Other summaries were prepared by Brim (1959) on parent education, by Dietrick (1960) on lecture and discussion, by Lionberger (1960) on the adoption of new farm practices, and by Rogers (1962) on all aspects of the diffusion of innovation. Annotated bibliographies were prepared by Schramm (1964) on programed instruction and teaching machines and by the National University Extension Association (1960) on correspondence education.

Design of Learning Situations

Research about program planning in adult education is sparse. Most of what has been done relates to the Cooperative Extension Service and is contained in graduate research reports. Stein (1960) analyzed correspondence course design and singled out four principles applicable to the method: (a) "the educational objectives must be appropriate to the medium;" (b) "the medium must be appropriate to the clientele;" (c) "the learning experiences prescribed must be appropriate both to the medium and the clientele;" and (d) "special care must be taken to insure that the planned learning experiences offer sufficient flexibility for an adult audience." In a case study analyzing the experience of the University of Chicago's Home-Study Department, Stein (1962) evolved a formula for making curricular decisions in planning adult correspondence courses.

Psychological factors affecting program design were examined by Lorge (1963) and Jensen (1963). Lorge listed four important implications for program planning derived from his study of adult learning: (a) within any group of adults, there are considerable individual differences which are greater than in groups of children or youth; (b) learning situations should provide a sense of mastery and success for the adult; (c) adults should be provided with rewarding learning experiences; and (d) every adult brings to any learning situation many resources which are a great asset in teaching adults. Jensen (1963) analyzed the dynamics of adult instruction and the types of sociopsychological interactions that affect learning. He enumerated a set of principles governing six types of interactions that develop in the instructional situation: (a) general sociopsychological conditions, (b) problem solving and task interactions,

(c) decision-making interactions, (d) social-influence interactions, (e) social acceptance and personal evaluation, and (f) informal private interactions.

There is little substantive knowledge about program planning to guide adult educators. This is an uncharted field in which research of any sort would be fruitful.

Organization of Learning Situations

The area of processes employed in educating adults has been a matter of confusion and conflict in terminology and constituent concepts that has seriously impeded the construction of a valid research design. In an effort to clarify this situation, with a view to providing a precise basis for research, Verner (1962) proposed a theory of adult education processes that drew sharp differentiations among the constituent processes that are precise and functional. He identified method as "the relationship established by the institution with a potential body of participants for the purpose of systematically diffusing knowledge." The method of education, therefore, identifies the way in which the potential learners are organized for purposes of instruction. Verner further identified three basic classifications of method in terms of pattern of organization: (a) individual methods, "in which the relationship established by the institution with the potential learner is on a one-to-one basis," (b) group methods, in which a relationship is established "among the participants and between them and the agent so that the learning process is under continuous direction," and (c) community methods, in which the learning situation is constructed "within the context of the social system so that learning occurs in a setting of reality."

Welch and Verner (1962) studied the relative effectiveness of an adult education group method (workshop) and a mass communication method (bulletin); they used the adoption of recommended practices as the measure of effectiveness. The study was conducted among food service industry members in four metropolitan areas. The group method was significantly better than the bulletin in changing behavior; each was superior to indirect influences for the particular group studied. Supplementing the workshop with the bulletin did not produce any statistically significant increase in adoption. This study, in effect, compared adult education and adult self-education and yielded significantly better results for the former.

A related study was conducted by James (1962) to determine personal preference for method used. He asked 503 basic airmen their preference between learning by lecture and by reading. James found no significant difference in scores on a posttest among those who indicated they preferred to learn from reading, those who chose lecture, and those who indicated no preference. For the group as a whole, however, reading produced higher scores.

The comparative effectiveness of adult residential and nonresidential education was studied by Lacognata (1961). Factors studied included the acquisition and use of knowledge about (a) attitudes relating to the insurance profession and to fellow students, (b) patterns of interaction, and (c) opinions of the program. On separate examinations for testing knowledge acquisition and knowledge application, residential students were superior. On the state examination combining the two dimensions, however, no significant difference was found between achievement of residential and nonresidential participants. Compared to the nonresidential adults, the residential participants showed significantly greater "professionalism" after the learning experience and did a relatively greater amount of studying out of class. Lacognata suggested that "the combined interrelated variables of isolation, continuity, and group influence were the determinants making for superior performance in residential programs."

Although the relative effectiveness of lecture and discussion has been the subject of many studies at the college level, very few such studies have been concerned with adults out of college. In a comparison of the effectiveness of university lecture and lay-led group discussion offered at the same time to adults in the Los Angeles area and using the same content, Hill (1960) found lecture and discussion about equally effective. More specifically, he found no significant difference in effectiveness between the two approaches (a) in improvement in the ability to identify concepts of anthropology, (b) in attitude changes, and (c) in changes in several areas of behavior. The study revealed large differences between lecture and discussion participants with respect to friendship and community involvement; discussion had definitely more impact. The greater influence of discussion in this regard may have been due to the "community-centered" locations of the discussion groups and the higher emphasis placed on social expectations by these participants.

Bigger (1961) studied the single meeting as a method of education by surveying the instructors. Of the 38 respondents representing approximately 30 universities in North America, 16 were identified as being primarily adult educators. A considerable majority were of the opinion that single presentation had some usefulness. Lecture-discussion was singled out as the technique best adapted to this method.

Management of Learning Situations

In his theory of processes for adult education, Verner (1962) identified two distinct elements in the learning situation: *techniques* and *devices*. Techniques were defined as "the relationship established . . . to facilitate learning among a particular and precisely defined body of participants in a specific situation." He further suggested a typology for the classification of techniques on the basis of use: (a) to acquire information, (b) to acquire a skill, and (c) to apply knowledge. An alternative scheme that may develop after sufficient research would classify techniques functionally on a two-dimensional scale, with one side indicating degrees of learner participation required and the other the degree of abstraction in the learning task. The materials, equipment, or conditions involved in the learning situation to supplement instructional techniques were identified as devices. In a later work, Verner and Booth (1964) suggested that devices perform four major functions: (a) illustrative, e.g., audiovisual aids; (b) extension, e.g., radio and television; (c) manipulative, e.g., tools and equipment; and (d) environmental, e.g., seating arrangements of participants.

Instructional Leadership

In a preliminary report of a study concerned with teaching styles and learning, Solomon and Miller (1961) identified seven clusters of styles established through correlations of data gathered from interviews with 13 instructors in various subjects. These clusters were then used in a larger study reported by Solomon, Bezdek, and Rosenberg (1963). In this study, 24 instructors of a specific subject were studied, and measures of instructor behavior were obtained from the students, trained observers, and tape recordings. The data collected produced 169 items referring to the behavior of each of the teachers. A factor analysis of these items produced eight clusters of variables: (a) permissiveness versus control; (b) lethargy versus energy; (c) aggressiveness versus protectiveness; (d) obscurity-vagueness versus clarity-expressiveness; (e) encouragement of content-related (factual) student participation versus nonencouragement of participation; (f) dryness versus flamboyance; (g) encouragement of students' expressive participation versus lecturing; and (h) warmth versus coldness. The findings of the study seemed to indicate that clarity-expressiveness and lecturing were most efficient in presenting and transmitting factual material. Comprehension, on the other hand, was related to a "moderate position on the permissiveness-control continuum" and to energy, aggressiveness, and flamboyance. Students evaluated most favorably those teachers receiving high scores on warmth and clarity. Class size was involved in a larger number of significant interactions than were any of the other variables. Students in large classes learned factual material best with teachers who emphasized student growth and who were permissive, warm, and flamboyant. Students in small classes did best with teachers who lectured, were relatively "dry," and emphasized student factual participation.

In a study based on a representative sample of informal adult education programs using voluntary leaders, Liveright (1959) analyzed the adult learning situation and the variations of leadership styles he observed.

He found four factors, any of which could be dominant in the adult learning situation: (a) kind of group, (b) kind of program, (c) role conceptions of the leader, and (d) use of methods and materials. In addition, Liveright found certain prior factors present and other factors developing during the program. Liveright observed that since leadership styles may be a product of the learning situation, the leader had to select a style assumed appropriate to the kind of program and kind of group. Inappropriate leadership style seemed to be related to a higher rate of participant dropout. From his analysis of the dynamics of the learning situation, Liveright arrived at five general conclusions: (a) an attitudinal program in a cohesive group calls for group-oriented leadership styles; (b) a skill program in a group with little or no cohesion calls for content-oriented leadership styles; (c) a primarily attitudinal program in a group evidencing little or no cohesion probably requires the leader to move gradually from content-oriented to group-oriented styles; (d) a skill program in a highly cohesive group requires the leader to use content-oriented styles as much as possible while at the same time to give the group some group-oriented characteristics; and (e) in an understanding program in a highly cohesive group, the leader must satisfy the group-oriented expectations and at the same time lean "in the direction of content-oriented styles."

Specific Techniques

Research studies related to instructional techniques for adult education are few, often poorly conceived, and generally inconclusive. For the most part, such studies as have been done are unrelated, and no logical synthesis is possible.

Dunnette, Campbell, and Jaastad (1963) experimented with the relative effectiveness of group and individual brainstorming. Two groups of 48 research scientists and advertising personnel respectively were presented with problems. Each subject brainstormed both individually and in a four-man team. The findings indicated that individuals produced more ideas than groups produced, without sacrificing quality. The superiority of individual brainstorming was increased when preceded by brainstorming in a group.

Jansen and Stolurow (1962) conducted an experimental study of role playing with female aides in a residential institution for the mentally retarded. They reported the pattern of group means that best represented the over-all effects of conditions used as (a) imitating aide's own role, (b) imitating many roles, (c) improvising aide's own role, and (d) improvising many roles. Imitating one's own role, although "most effective in producing larger number of greater changes," was found to be least liked by the aides.

Palmer and Verner (1959) compared the effectiveness of lecture, discussion, and lecture-discussion techniques within the class method at an Air Force Primary Pilot Training School. The study involved 130 students in six classes in aviation physiology. On a test of immediate recall, the lecture technique produced a higher achievement gain than did the discussion or lecture-discussion technique. In assessing student satisfactions, Palmer and Verner found that students (a) preferred the lecture-discussion method, (b) wanted a lecture for at least part of the instruction period, (c) wanted to participate but preferred minimal participation, (d) "preferred a change of pace to break the monotony of lecture or discussion only," and (e) "frankly admitted that discussion technique required too much extra work in preparation."

Illustrative Devices

Duvall and others (1960), reporting on a similar study of technical training which used films or slides combined with tape recordings, stated that either device can be substituted for face-to-face instruction. Trainees in the study did not raise any objections to this means of instruction.

Kreitlow and Edwards (1962) compared the effectiveness of lecture, bulletin, film, and television in reporting research to adult groups. They found lecture to be the most effective process. The bulletin was found to be more efficient than film or television, but not significantly better. For all media used, the number of correct responses was related to the academic grade level attainment of the participant.

Environmental Devices

A pilot study by Kennedy and Klein (1960) was designed to examine seating behavior of large groups as it related to effectiveness of communication or learning. The study was conducted with two large groups (experimental groups) and small discussion groups (control groups) during a summer laboratory of the National Training Laboratories. Kennedy and Klein found that (a) males were more consistent in their seat choice from meeting to meeting; (b) those who arrived early were more consistent in their seat choice; (c) early arrivers tended to rate meetings higher than did late arrivers; and (d) the data did not indicate any significant relationship between control group participation, ego strength, movement score, and reaction to large meetings.

Conclusion

The development of systematic research relating to program design and instructional processes for adult education has been impeded by the lack of a clear theoretical framework and by the absence of unanimity in the identification and designation of the processes studied. As a result, studies reported in the literature showed inadequate controls in the research design. Most researchers have been concerned with determining the comparative effectiveness of one process over another, but too often they studied processes on different levels. Furthermore, the absence of precise definition and description of the processes examined makes the synthesis of research virtually impossible. Dietrick (1960) found so many different notions about what constituted *discussion* that the effectiveness of discussion as an instructional technique could not be ascertained in spite of the prevalence of studies purporting to do so. The theory of processes proposed by Verner (1962) suggested ways of establishing system and precision in this area of research that may lead to more significant research in the future.

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CHAPTER III

Evaluation of Outcomes

WILSON B. THIEDE and JOHN MEGGERS

Evaluation has come late to the field of adult education. For many years, its justification was deemed to be its continued existence. Because most programs for adults are of relatively short duration and the curriculum is almost never sequential, evaluation attempts have relied heavily on participant assessment rather than on measured behavioral change. In addition, much of the technical competence necessary for evaluation was housed in schools of education which, except for a few, were oriented almost exclusively to elementary and secondary education. Exceptions to this absence of competence and interest have been the supporting staff of the Cooperative Extension Service and a number of sociologists, the latter being attracted to adult education in part because of objectives related to social rather than individual change. During the past few years, the number of well-designed evaluations has increased. Because of this increase, Thiede and Draper (1963, 1964) included a category of evaluation in the annual bibliography of studies in adult education.

Assessment by Participants and Leaders

Kaplan (1960) completed a carefully designed study of 150 participants and leaders in liberal arts discussion programs in the Los Angeles area. His purpose was to determine the participants' assessment of whether participation developed intellectual growth, civic participation, or continued study. More than 25 percent felt that they had gained "a great deal" more knowledge, and almost two-thirds reported they gained "some" more knowledge. In programs with the best textual materials, larger percentages reported gaining "a great deal." More than two-fifths reported that they either read more than previously or read more serious works. More than one-half of the participants reported that they had changed some of their views. However, many members felt that little change had occurred. The discussion programs stimulated 48 percent of the participants to continue their educational activities in discussion groups or formal courses. Little evidence was found for greater participation in community activities or public affairs following participation in the programs. Participants who were not college graduates were more critical of leaders and more conscious of the absence of subject matter specialists than were those who were graduates. The investigators concluded that "the Liberal Arts Discussion Program for Adults performs a valuable educational function."

From the results of a questionnaire study, Edwards (1962) reported that in the Knoxville High School Adult Program, 92 percent of those surveyed were working for a high school diploma; they liked the freedom of choice of courses; they felt the school library needed more space and materials; they had divided opinions on preferred methods and teacher qualities; and a majority indicated that they would not attend day high schools to complete their education. Similarly, Manley (1961) studied students and teachers of an extended day program of a state college in California. He found no significant difference in academic training between day and extended day instructors, but a significant difference in distribution by rank, with fewer senior-ranked faculty members in the extended day program. Grading standards were not significantly different. The faculty felt that there was better academic achievement in the day program; 40 percent of the students concurred in this judgment, although 12 percent felt the extended day program was more rigorous. Students felt that regular day students had better library access and that the extended day program needed better advising and counseling services.

Measures of Knowledge and Information

In an extensive and well-supported study of the Great Books programs, Davis (1960) studied a national sample of 1,909 participants in 172 discussion groups. He used participant assessment and tests of beginning and continuing participants. The self-reports indicated that (a) levels of satisfaction were high; (b) people who wanted to achieve something particular were more likely to report having achieved it; and (c) those who wanted an effect attainable in the group were more likely to report having attained it than those desiring an effect attainable outside the group. After three years in the program, participants with no previous college training scored as high on tests of knowledge as did the beginning members with a degree. The test was specially designed to measure familiarity with the liberal arts and humanities, musical sophistication, and sensitivity to excellence in verse. There was no difference between beginners and advanced members in ability to judge excellence in verse or in familiarity with classical music. Continued participation seemed to be accompanied by an increase in the number of hours in "serious" reading, by an expansion in the breadth and scope of religious ideas, and by an increased concern for civil liberties and "too much government." In a study of nine homemaker clubs in Indiana divided into three groups on the basis of the amount of training received in discussion techniques, Willsey (1962) found no statistically significant differences in the amount of information learned about home safety. The investigator concluded that if the primary emphasis were on the acquisition of information about the subject to be discussed, knowledge of group discussion processes was probably unrelated.

Comparative Studies

In the third of the major studies of discussion groups, Hill (1960) compared their relative effectiveness with the lecture method. He studied 12 discussion groups of at least 20 members and one large lecture of more than 100 members. His evaluation procedures included a pretest and a posttest, interviews early and at the end, and observations of all sessions. The general subject matter was the same for all participants and was treated in 11 two-hour sessions, each of which included a 30-minute dramatic recording. The same reading material was used by all members. The members evaluated the program favorably, but retained their original preference for lecture or discussion. There was no superiority of either method in ability to identify anthropological concepts. Neither method had much effect on the mean average attitude related to ethnocentrism, tolerance of ambiguity, democracy, or adult education. Kreitlow (1962), in one of a number of studies comparing methods of disseminating research information, found the lecture more effective than the film, bulletin, or television; the bulletin was the next most effective method. However, adults retained significantly more information presented by bulletin than that presented by the other methods. In a well-designed study using a knowledge test and attitude scales, Marsh and Hyman (1964) compared the effectiveness of programed self-instruction and a workshop. The subject was the use of radio in extension programs, and the participants were agents of the Cooperative Extension Service in North Carolina. The two methods were equally effective in increasing knowledge, in developing more positive attitudes toward the use of radio, and in changing the agent's concept of his ability to do radio teaching.

Adoption of Practices

One of the characteristics of adult education is the desire by the adult to have learning immediately affect life outside the program. A criterion that has been widely used in the Cooperative Extension Service is adoption by the participant of the practice or behavior desired. Hardee (1963) studied the effectiveness of an extension program in developing the resources of part-time farm families. He worked with 185 families, which were divided into two groups for analysis: (a) high integration and (b) low integration with the extension program. The program consisted of farm and home visits, tours, demonstrations, 4-H Club work, and use of mass media. Hardee reported that (a) the average value of sales of farm products increased substantially; (b) the median off-farm income increased (families with high integration had the lower increase); (c) family level of living increased more with the high integration group; and (d) the high integration group made more changes in farm and home practices. Marsh (1962) studied the effectiveness of extension programs in increasing income and raising family living level over a five-year period. He selected 50 families from each of eight counties. The experimental group increased acreage from 108 to 136 acres, compared to increases from 120 to 135 acres for a control group. The experimental group increased the size of the livestock enterprise substantially, compared to the control group: swine increased 105 percent in the experimental group and only 57 percent in the control group. Value of farm products sold increased to a greater extent in the experimental group than in the control group. The experimental group made the greater increase in amount of food preserved.

Porter and Wilson (1962), using a random sample drawn from a community telephone directory, studied the impact of a consumer marketing program. The program consisted of a television appearance, a weekly newspaper article, four one-minute tapes for radio, and a two-page bulletin mailed to 600 persons. Consumer knowledge and behavior were both affected by the special marketing program. Those who recalled being exposed to one or more of the program items knew more about pork and its uses and were more likely to have bought and served pork during the week following the program. Welch (1961) used a group method, a mass media method, and a combination method with samples drawn from restaurant operators who were subgrouped according to attendance or nonattendance in a clinic. Those who had attended were divided into two groups of 17 each; the bulletin was mailed to one of the groups. Those who had not attended were divided into two groups of 33 each; the bulletin was mailed to one of the groups. The group method was significantly better for those who sought knowledge than was the bulletin for those who did not. In turn, the bulletin was more effective than dependence upon indirect methods. The direct mailing of the bulletin to supplement the group method did not result in any significant increase in adoption of recommended practices.

Research Critiques and Theory and Instrument Development

Attention needs to be called to a careful and exhaustive analysis of evaluation research by Wilder (1959). Wilder pointed out the importance of objectives and the necessity for a frame of reference to guide the research. He related attendance, participation, and dropout studies to evaluation and review methods studies in parent education, race relations, cancer education, and a communitywide information campaign about the United Nations. The need for conceptualization was presented, including specification of the independent variable or program, specification of the dependent variable or goal, and careful development of an appropriate study design. A most useful and concise treatment of experimental and quasi-experimental designs was prepared by Campbell and Stanley (1963).

Martinez (1964) surveyed 91 evening high school administrators and 42 evening high school teachers to obtain useful criteria for evaluating adult curriculum. The two groups agreed on a number of criteria, such as objectives, achievement, requirements for diplomas and certificates, reasons for dropout and for re-enrollment, curricular flexibility, and influence of the curriculum on the community.

Miller and McGuire (1961) began the definition of major objectives in four liberal adult education areas: political and social, community participation, moral and ethical, and arts. Working with a number of adult educators they proceeded from precise definition of objectives to the development of instruments. In each of the four areas they specified content objectives, behavioral objectives, and models for measuring the attainment of the objective.

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CHAPTER IV

Psychology and Learning

HOWARD Y. McCLUSKY

In spite of relative neglect, the psychology of adults continues to gain ground as a subject of systematic inquiry. The 1961 White House Conference on Aging and the National Institute of Child Health and Human Development are illustrative of the growing investment of the federal government in this domain. Revised editions of textbooks in developmental psychology now give more attention than formerly to the full life span (e.g., Goodenough and Tyler, 1959; Vincent and Martin, 1961). Earlier longitudinal studies of children are now extending into the adult years (e.g., Kagan and Moss, 1962), and practically all gerontological research uses subjects in early or middle adulthood as a basis of comparison with performance in later maturity.

Further evidence for the continued growth of the field may be found in reviews by Birren, Jerome, and Chown in the December 1961 issue of the REVIEW, Birren (1960), Chown and Heron (1965), Kuhlen (1963b), and Williams, Tibbitts, and Donahue (1963) and in the publications of Brunner and others (1959), Knowles (1960), Shock (1963), and Tibbitts and Donahue (1962). A new textbook by Birren (1964), *The Psychology of Aging*, is by all counts the most comprehensive and thorough treatment now available in the field by a single author.

Change in Psychological Abilities with Age

Longitudinal studies provide the most convincing data related to change in abilities with age. These may be divided roughly into two categories, one involving a long interval and the other a short interval of years between testing. As an example of the long interval group, Bradway and Thompson (1962) administered the *Stanford-Binet* and the *Wechsler Adult Intelligence Scale (WAIS)* to 111 subjects at about age 30 who had formerly taken the *Stanford-Binet* at the preschool and adolescent levels. On the average, mental growth increased beyond 16 years by about 11 IQ points, more in men than in women. The greatest increases occurred in tests of abstract reasoning and vocabulary. The gifted children studied originally by Terman are now in the middle years of adulthood and are still gifted, with above-average ability to perform on tests of conceptual thinking (Terman and Oden, 1959).

Perhaps the most convincing data of the period are those contained in a follow-up study of adults who were tested for the first time at about age 20 with the *Army Alpha Intelligence Test* (Owens and Charles, 1963). Retested for the second time at about age 61, the subjects maintained their earlier level of performance, with a decline only in tests of numerical ability. In the first follow-up, when his subjects were age 50, Owens (1959) found that "increments and decrements in test scores from age 20 to age 50 were roughly comparable at all levels of initial ability."

Short interval studies have more often used subjects aged 50 and over and, as in the case of the long interval research, have shown little decline in performance. In an investigation of 165 persons over 50 years of age, little over-all decrease in the full-scale *WAIS* was revealed after a three-year interval (Eisdorfer, 1963). Tested first on the *WAIS* and retested 10 years later on the same test, 28 men maintained "reasonably constant" IQ's (Duncan and Barrett, 1961).

The results of cross-sectional investigations compare favorably with results of longitudinal research. In general, tests requiring motor performance and response to perceptual content show decrease with age, while those measuring stored experience (e.g., vocabulary) show increases. In a study by Bilash and Zubek (1960), scores on tests of perception and dexterity declined from the second to the eighth decade, whereas scores on tests of verbal fluency and comprehension maintained their initial levels until about the mid-forties. Birren and Morrison (1961), in a study using the *WAIS* with subjects aged 25-65, also revealed a differentiated response with age, but with significantly higher correlations with years of education. In a carefully executed study of a group of elderly men thoroughly screened for health, Birren and others (1963) reported that the healthy subjects turned in a verbal performance higher than that expected for young adults, but scored much lower on the digit symbol test.

Studies of the change of problem-solving ability with age have particular relevance for practitioners of adult education. In a large-scale investigation, Friend and Zubek (1958) administered the *Watson-Glaser Critical Thinking Appraisal* to 480 subjects aged 18-80. Results showed a rapid decline from peak performance at 35 years. Low objectivity and a tendency to avoid logical analysis increased with age. In a laboratory situation, Jerome (1962) compared the performance of women of mean age 23 with that of women of mean age 65. He concluded that problem-solving ability decays with age, especially the faculty for recognizing the time to apply heuristically controlled behavior.

The manner and extent to which curves of problem-solving ability differ from known curves of general intelligence have important implications not only for the researcher but also for the practitioner of adult education. Obviously, factors such as disuse and set may in too many cases interfere with continuing development of an adult's ability to reason and conceptualize his experience.

Rigidity and Set

Of particular relevance for any examination of the psychology of adults is the extent to which, and the circumstances under which, resistance to change increases with age. In a recent and thorough review of the literature, Chown (1959) pointed out somewhat paradoxically that "rigidity is a very flexible concept." In a later investigation, generally regarded to be one of the most penetrating analyses of the problem, Chown (1961) demonstrated that rigidity should not be regarded as a generalized trait but as an attribute of behavior which varies with the nature of the task and that it is more significantly associated with low intelligence than with age. In one study, Botwinick (1962) discovered that in a structured situation providing a "set to shift," older subjects performed with minimum difficulty; in another, Botwinick and Brinley (1962) concluded that older people give optimum performance if a task is clear and time is allowed for monitoring and correcting potential errors. Self-pacing may contribute to this process; at least it improves performance. At the same time, in certain circumstances, some resistance to change may be an advantage: for example, Warren (1961) found that older subjects were less inclined than younger subjects to distort words in response to a tape recording.

Learning and the Learner

Even though adult educators may regard rote learning as an unrealistic, if not unfair, measure of adult learning ability, it is interesting to note the conditions under which it improves. A longer period of exposure was found to lead to improved verbal performance on the part of persons over 60, even after it brought about no gain for persons between 20 and 50 (Chown and Heron, 1965). Canestrari (1963) reported that self-pacing led to faster learning in older, but not in younger, subjects. In both cases, omission errors decreased. Parenthetically, it is provocative that rote learning in the very old may offer a fair prognosis of the number of years a person has yet to live (Sanderson and Inglis, 1961).

After interviews with 22 highly involved adults, Houle (1961) classified his subjects into (a) goal-oriented, (b) activity-oriented, and (c) learning-oriented learners. Taking off from Houle's typology and equipped with responses to questionnaires administered to persons attending various adult education conferences, Sheffield (1964) divided Houle's goal-oriented category into personal-goal and societal-goal orientations, and his activity-orientated category into desire-for-sociability and need-fulfillment orientations. Sheffield also found that participation correlated positively with learning and personal-goal orientations. Ingham (1964) found four leisure types, while Brown (1964) discovered that alumni of highly rated colleges were more likely to pursue educational activities after college than were alumni of colleges with average ratings.

In one of the most convincing studies of the period covered by this chapter, Wolfe (1963), using a test of adult adjustment, *Your Activities and Attitudes*, dichotomized a large number of persons over 65 into two groups, one well adjusted and the other poorly adjusted. In practically every type of adult education activity examined, he found that well-adjusted adults had a much more impressive history of participation than did the poorly adjusted adults. This was true for those having had only an eighth grade education as well as for those who continued in school long after graduation from high school.

Attitudes and Emotions

Large numbers of people in our society hold a negative attitude toward the last third of life, according to Axelrod and Eisdorfer (1961) and Eisdorfer and Altrocchi (1961). Even some gerontologists share this attitude (Arnhoff and Lorge, 1960). However, Tuckman, Lorge, and Zeman (1961) found no loss in the intactness of self-drawings with age. Other studies show self-depreciation associated with age (e.g., Bloom, 1961); some show ambivalence in self-attitudes (e.g., Werner and others, 1961); and others disclose a disposition on the part of many adults to consider themselves younger than their chronological years (e.g., Zola, 1961). Wallach and Kogan (1961) found older men having less self-confidence than younger men. In another study, Kogan and Wallach (1961) reported a decline in the level of self-concept with age and a greater willingness among older persons to admit unfavorable elements in their concepts of the ideal person. This latter outcome could be regarded as a gain, if it means that older people tend to be less ego-defensive and more tolerant of personal imperfections.

In a nationwide mental health survey, Gurin, Veroff, and Feld (1960) reported that for both sexes psychological and physical anxiety increased from age 21 to age 65 and that "immobilization" decreased. These results are consistent with recent investigations of the variation of emotional responsiveness with age. In a group of 200 men ranging from 50 to 95 years, the third who admitted having had the emotions investigated were found to experience a decrease in anger, irritation, and boredom with age and an increase in loneliness (Dean, 1962). For older people, loneliness was defined as absence of activity rather than absence of people. Confirming the same trend, the use of strong emotion in *Thematic Apperception Test* stories declined in subjects aged 40-71 (Rosen and Neugarten, 1960). Similar results were secured with the use of stick (neutral) figures as stimuli (Lakin and Eisdorfer, 1960).

Using the results of a nationwide survey of men and women aged 21-65, Veroff and others (1960) reported that the need for achievement dropped in men, but their need for power rose with age; in women, both the need for affiliation and the need for power declined with age. Studies showing a "flattening" of emotional response with age, however, could be misleading. For example, Friedsam (1961) found that people aged 60 and over were much more disturbed than younger adults over the loss of personal possessions caused by disaster. Older persons saw the losses as irreversible, while the younger adults felt that they had time for replacement. This difference in the reaction of the two age groups points out the extreme importance of the time dimension in assessing the outlook of adults at various stages in the life span.

Change in Personality with Age

Although preceding sections dealt with selected dimensions of personality, a number of studies embodied a more global approach to personality change. In one study of hospitalized men aged 22-76, Edwards and Wine (1963) reported that 11 of 41 personality variables correlated positively with age. However, these correlations approached zero when the groups were equated for intelligence. Reichard, Livson, and Petersen (1962), using psychoanalytic concepts, conducted extensive interviews with 42 retired and 45 soon-to-be-retired men. The results indicated that the preretirement period was characterized by instability and a sense of insecurity, while the postretirement period was noted for a reduction in defensiveness and the development of a favorable view of the earlier stages of life. A factorial analysis of the data disclosed three groups of successful adjusters and two groups of unsuccessful adjusters. In the former category were (a) the mature group, described as having a constructive approach to life, (b) the rocking-chair group, composed of highly dependent persons, and (c) the armored group, possessing well-developed defenses against anxiety. In the unsuccessful category were (a) the angry group, hostile and often blaming others for their shortcomings, and (b) a small cluster of self-haters.

By all counts the most systematic and significant effort in this field is the project known as the Kansas City Study of Adult Life conducted by a research team from the University of Chicago (Neugarten and others, 1964). In general, the studies in this project may be classified into two categories: (a) research dealing with the intrapsychic processes of personality less available to awareness and conscious control and not necessarily expressed in overt patterns of social behavior and (b) investigations of dimensions more socioadaptational in character, focused on the more purposive elements of personality in which attempts at control of self and life situations were conspicuous. In the former category, the processes showed considerable change with age; in the latter, individual differences were relatively independent of age.

More specifically, in one study of the first (intrapsychic) group, age was associated with change from active to passive mastery (Gutmann, 1964), with change from outer-world to inner-world orientation (Neugarten and Gutmann, 1964), with a separation of certain types of rational processes in the motivation of social behavior (Rosen and Neugarten, 1960), and with lessened sensitivity and relatedness to others (Shukin and Neugarten, 1964). In the intrapsychic group, sex differences increased with age with older men, who were more receptive than younger men to their "affiliative, nurturant and sensual promptings," and with older women, who were more acceptive than younger women of their "aggressive and egoistic impulses." As indicated above, however, in the socioadaptational category, such variables of social adjustment as integrity (Gruen, 1964), adjustment (Peck and Berkowitz, 1964), and cognitive competence (Neugarten, Crotty, and Tobin, 1964) were not related to age, and both middle-aged and older persons were found distributed throughout the integrated, defended, and unintegrated types (Neugarten, Crotty, and Tobin, 1964).

Theoretical Approaches to Change with Age

One of the promising trends in recent and current psychoanalytic thinking is the development of ego psychology. With its more or less exclusive emphasis on libidinal processes, adherents to classic Freudian psychoanalytic theory formerly assumed that the crucial events in personality formation occur in infancy, childhood, and adolescence and that the adult personality is practically set for life by the end of adolescence. But in the writing of persons such as Rapaport (1959), ego psychology has received the emphasis it has long deserved and should provide a fruitful hypothesis for understanding the adult personality. The proceedings of the First Annual Scientific Meetings of the Boston Society for Gerontologic Psychiatry (Zinberg and Kaufman, 1963) are illustrative of this fact, as is the research of Gutmann (1964).

Another boost for a theory of the adult phase of the life cycle is contained in the writings of Allport (1955, 1961). His concepts of propriate striving, functional autonomy, and "becoming" are extremely congenial to an understanding of the adult years. In some respects, Allport's thinking complements that of the ego psychologists, but Allport is not a psychoanalyst, and his theoretical position is well able to stand on its own merits. His chapter on the mature person is a classic (Allport, 1961).

At the same time, Erikson's (1959) psychological adaptation of the theory of epigenetic development, while still essentially in its original stage of formulation, is becoming the stimulus for research on adult personality (Gruen, 1964). Kuhlen (1963a) elaborated his three-stage theory of adult motivation; Neugarten and others (1964) placed the Kansas City Studies of Adult Life in a plausible and perceptive theoretical context; and McClusky (1963), with his concept of margin as the ratio of load over power, made another attempt to provide a conceptual framework for the understanding of personality change with age.

One of the most discussed theories related to the middle and late years is that of disengagement. It has received increasing attention in recent literature (Cumming and Henry, 1961), but both Havighurst (1961) and Buhler (1962) were apparently not willing to concede that the concept of disengagement accounts for all of the phenomena associated with the passage of time from 40 years to the end of life.

Conclusion

When one scans the terrain of recent psychological production he is impressed with a number of items. First, one is impressed with data showing the great range of individual differences that increase with age. So extreme are the differences that one must be very cautious about the kind of claim he makes for the validity of his generalizations. Second, and a consequence of the first point, data from various sources are providing a growing case for a differential psychology of adults. Already it is clear that the pattern of abilities increases in difference from adolescence through early adulthood and on into the middle and late years. Moreover, we cannot assume equivalence of stimulation and motivation in these successive stages of change. Third, more research is greatly needed, but it must be conducted with concepts and instruments that are most relevant to the unique features of the adult condition. For example, more work needs to be done on an appropriate criterion of adult intelligence, on "age fair" tests, and on devices that get beneath the surface of the adult personality. Fourth, there is a serious lack of research dealing with the lower class adult. This is an important area of inquiry in its own right, but will become increasingly important as the implementation of recent civil rights and economic opportunity legislation gains momentum. Fifth, the problem of adult psychology is in part a problem of the conservation of human resources. Already the limits of the productive years are moving upward in both theory and practice. As indicated earlier in this chapter, overcoming the discrepancy between curves of problem-solving ability and general intelligence would represent a great gain in adult performance. Finally, we are more than ever confronted not only with discovering talent and creativity for the first time, but with giving both an opportunity to develop through as long a period of the life span as possible (Botwinick, 1964).

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CHAPTER V

Socialization

GALE JENSEN and ALBERT SCHRADER

The sociopsychological processes by which the human being becomes socialized have long been of interest to behavioral scientists and educational practitioners. Most of the theoretical and research work pertaining to socialization phenomena, however, has been devoted to socialization of the young, particularly the child rearing and training practices of different communities, social classes, and cultures. In recent years, development of industrial societies has begun to force researchers to focus some attention upon the socialization of adults.

Three developments in particular stress the significance of adult socialization in these kinds of societies. First, many adults whose social learning as children took place in rural communities and small towns have moved to metropolitan and suburban communities. Much of the social learning in which their adult social lives are grounded is inadequate and obsolete. Second, technological and industrial developments have greatly increased the rate of reorganization of social environments. Since radical kinds and amounts of social reorganization take place within the span of an individual's lifetime, adults must acquire new social learnings if they are to cope productively with the problems of their communities and societies. Third, the extraordinary development of modern formal organizations has created a situation in which most adults invest the major part of their time and energy in the ventures of such an organization. Since an individual's personal and family welfare depends upon how well he is able to function within these conditions, formal organizations generate powerful forces on the individual to acquire the necessary social learnings. Consequently, adults may undergo a kind of socialization that is beneficial to the formal organizations in which they function but not to their families and communities.

Theoretical and research studies that are identified as adult socialization studies are seldom found in the behavioral science periodicals. However, there are a number of studies that provide data about the kind of behavioral changes adult subjects undergo in different kinds of social situations; the theoretical and research literature reviewed in this chapter is based on studies of this kind. Since the adult spends a great share of his energy and time within formal organizations, special effort was given to locating studies that provide data about the kinds of social learnings that result from such participation.

The procedure employed in reviewing the literature first required the perusal of diverse journals in order to locate articles that provided theory and research data about the social learning or spontaneous behavioral changes manifested by adults in social situations. The second step was to organize the articles and books so identified into a preliminary bibliography from which studies of particular interest could be selected for more intensive examination. A conceptual framework, devised to review the different studies in a common way, provided a means to examine the social situations or environments to identify the structural, social-interaction, and cultural influences on the adults involved in the studies. The object of this analysis was to identify the operating psychological conditions. An attempt was then made to determine the kinds of cognitive, affective, and motor responses the subjects made when trying to participate effectively under these conditions. Finally, the reviewers attempted to identify the kinds of social learning that emerged from this experience in terms of perceptions, affective attitudes, motivations, social skills, and social values for governing behavior in similar situations.

Motivations

In a longitudinal study involving 6,544 high-aptitude college students, Astin (1963) discovered that the motivation to earn a Ph.D. degree increased in those students who attended coeducational liberal arts colleges, but decreased in those students who attended northeastern men's colleges. This suggests that the organizational cultures of the different colleges might produce changes in motivations for further academic degree work. McDill and Coleman (1963), in a study of the influence of high school social status upon acquiring motivations (a) to attend college and (b) to attain high academic achievement, found that students of high social status had acquired positive orientations for attending college and negative orientations for high academic achievement. These findings intimate that the prestige structure of an organization produces motivations for different kinds and levels of personal achievement.

Strauss (1964), using purchasing agents as subjects, identified a set of sociopsychological conditions which seemed to lead to learning motivations for professionalization. It would appear that whenever persons trying to increase their prestige and power come into conflict with the different working groups of an organization, they turn first to upper management for support; if they fail to obtain such support, they often are attracted to professionalization as a means of improving their self-images.

Guest (1962) reported on a case study in which changes in the authority and communications structures of a large industrial plant brought about changes in the motivation of subordinates to initiate interactions with their superiors. A study of young adults by Gruber and Weitman (1963) gave evidence that motivation for accepting and directing intellectual development was developed by changing (reducing, in this case) the amount of class time during which instruction was directly under the control of teachers.

Perceptions

Utilizing both professional and subprofessional staffs in hospitals, Haas (1964) discovered that the degree of perceptual consensus about the nature and function of their work roles was inversely related to the amount of friction that existed between them. These findings strongly suggest that some kind of socialization is at work which produces a lack of perceptual agreement about the functions of different roles, which in turn produces friction between the roles to a degree commensurate with the lack of perceptual agreement. Jensen (1962) found that when the perceptions learned about the authority relations between roles were in high disagreement, the decisions made about hospital operation were disruptive to a large number of role occupants and produced frustration, a reduction in job performance, and sometimes a drop in work motivation. These consequences seemed to reinforce the learning of misperceptions about authority relations, thereby creating a vicious circle. It would seem that when hospital personnel acquire incompatible perceptions about authority relationships between roles, they behave in a way that violates the criteria for therapeutic conditions for mental patients. Pearlin (1962) studied certain sociopsychological conditions that produced alienation behavior in nurses with respect to their work. In particular, he found that alienation from work was produced whenever the authority structure of the organization was such that (a) great positional disparity existed between superordinates and subordinates; (b) authority was exercised in a peremptory fashion; (c) persons in authority were physically inaccessible; and (d) extrinsic rewards were unsatisfactory, and little opportunity for attaining a sense of achievement through work was present.

Parker (1963) sought to identify the sociopsychological characteristics of organizations that had some effect upon the social learnings that adults would acquire by participating in them. He identified three kinds of characteristics: performance motivations, leadership climate, and worker autonomy. One interesting finding with respect to performance motivation was that the sociopsychological basis on which group productivity rested was the perceptual learning, termed "job performance is instrumental or related to job security." In brief, unless the performance motivation dimension of the organization produced the perceptual learning that "job performance is instrumental to job security," the productivity of the organization would fall.

Attitudes

In a series of studies, Porter (1962; 1963a, b, c, d) examined a number of sociopsychological characteristics of organizations with respect to the kinds of affective attitudes that develop in adults from this socialization experience. In a study of the formation of job satisfaction attitudes by managers, Porter (1962) suggested that managers develop positive affective attitudes toward their jobs when they perceive themselves at a vertical level within the management structure that is commensurate with their needs for self-actualization, autonomy, and esteem. Stated propositionally, the findings seem to say that managers have strong needs for self-actualization, autonomy, and esteem; when they are able to attain managerial positions that can fulfill these needs, they will develop favorable affective attitudes toward their jobs. Porter (1963a) showed that higher-level managers placed relatively more emphasis on self-actualization and autonomy needs than did lower-level managers. This raises the extremely interesting problem of whether the managers achieved these higher-level positions because of stronger self-actualization and autonomy needs or whether the intensity of these needs is a product of socialization. Porter (1963b) examined the differences in perceptions of need fulfillment of line and staff managers as provided by their jobs. He found that autonomy was more important to staff managers than to line managers. Again, one wonders whether the difference in intensity of this need is a result of socialization or whether it is a personality characteristic that is fulfilled or frustrated depending upon the job situation of the person. Another intriguing finding by Porter (1963c) was that, at lower levels of management, small-company managers were more satisfied with respect to need satisfaction than were large-company managers; at higher levels of management, the reactions of the managers were reversed. These findings suggest strongly that something other than personality characteristics is needed to explain these patterns of affective attitudes. A final study of managers by Porter (1963d) indicated that affective attitudes were related to the size of the company. The study utilized 1,700 managers from small, medium, and large companies. In terms of a number of adjectives describing affective responses to job experiences, large-company managers had a quite different "affective profile" than small-company managers. The affective response profile of large-company managers was "good, interesting, difficult, intense, complex, profound, challenging, and competitive." The affective attitudes of small-company managers with respect to their job experiences were "boring, bad, easy, relaxed, simple, informal, superficial, not challenging, and cooperative." One thing is clear from this study: the socialization processes in these settings are quite different and produce quite different social learnings. Vroom's (1962) findings supplemented Porter's. They indicated that the amount of ego-involvement in a person's job functions and the resulting satisfaction with self, others, and job were related to the amount of self-expression permitted by the person's sociopsychological environment.

Fleishman and Harris (1962) conducted a study with foremen pertaining to the development of affective attitudes which develop as a consequence of the leadership structure and policies for handling employee problems. Their findings suggested that high grievance feelings and job turnover were associated with organizational environments in which arrangements for leadership were highly structured and little consideration was shown for the problems of employees. A study by Argyris (1962), which examined the interpersonal competence of executives, tended to support the findings of Fleishman and Harris. Both Yanouzas (1964) and Argyris (1964) produced works which indicated that the formal work structure in which people find themselves acts as a strong influence upon the kinds of affective attitudes they will develop about their work situations. It is clear, also, that when the work structure is highly planned and produces a depersonalized psychological environment, behavior which is detrimental to both the people and the organization begins to emerge.

Social Skills

Houton (1963) suggested that adults learn actively and consciously to manipulate their relations with others when sociopsychological environments are unstable and subject to rapid change. In a study of the effect of school size upon participation in extracurricular activities, Barker and Hall (1964) stated, "We conclude that the Seniors of the small schools reported more extra-curricular activities than the Seniors of the large schools by a factor of over two to one." Since the over-all research project from which this report derived its findings involved some 38,172 high school students, the findings of the study cannot be viewed lightly in terms of the possibilities that the socialization that takes place in different-sized schools may possibly have some effect upon the kind of participation skills and motivations that are learned. Gump and Friesen (1964a, b) examined the amount of participation and degree of satisfaction that high school students of different-sized schools experience. In the latter report, they stated that "Juniors from the small schools reported more satisfactions relating to competence development, to challenge and big action, to group action, to 'uplift' values; large school Juniors reported more satisfactions dealing with vicarious enjoyment, with large entity affiliation, with learning *about* their school's persons and affairs and with gaining 'points' via participation." This shows clearly that the social skills being acquired through socialization in the different-sized sociopsychological settings were quite different; one wonders which set of skills will prove best for the welfare of American society. Campbell's (1964) study of the effects of high school consolidations upon the behavior students acquire through socialization showed that the social skills and motivations of students underwent a change with transfer from a small local high school to a large countywide high school. Students experienced a decrease in personal responsibility associated with extracurricular activities and a decrease in a number of satisfactions associated with physical well-being and with development of intellectual interests, self-concept, and zest for living. This study not only provided an insight into the differences in the kind of social learning that takes place in different sociopsychological settings but also, in light of some of the social and health problems of the American society, raises the question of whether many of these settings that have evolved without much examination are developing social learnings which leave adults behaviorally incapable of dealing with family, community, and work problems and consequently result in family and personal breakdowns.

Values

In a study dealing with the relationships between job classification and the life-work values considered most important by laboratory workers, Boggs (1963) discovered that technicians and professionals had a somewhat reverse set of values with respect to the kinds of rewards one should derive from work. Technicians placed heavy emphasis upon such extrinsic kinds of rewards as pay and job security, while professionals stressed intrinsic kinds of rewards such as the satisfactions that come from doing enjoyable work. Both groups had some interest in opportunity for advancement, but this value seemed to be much more important for professionals, who valued it much more highly than pay and job security. Again, there is a question concerning whether these values are the result of socialization taking place in the laboratory or whether they represent personality development from some previous socialization experience which resulted in the kinds of job classification to which these people gravitate. Either way, it is rather clear that these people have undergone, or are undergoing, socialization that results in the acquisition of different kinds of values about life work.

Youngberg, Hedberg, and Baxter (1962) conducted a study that portrayed the significance of values acquired by insurance salesmen through socialization. Their findings indicated that insurance salesmen have acquired a set of values of such a character that even though they are dissatisfied with the plan of compensation through which they receive extrinsic rewards, the public attitude toward their occupation had greater power for determining whether they experienced high or low gratification from their work.

Conclusion

The literature reviewed suggests that adult socialization is highly significant in the field of adult education. Perhaps it should be one of the major areas for theory and research development; nothing would seem more important for the development and survival of the American society than the formulation of knowledge that would enable people to perceive accurately the kinds of social learning being acquired by

American adults. Lack of this kind of knowledge ultimately led to the downfall of many of the influential societies of the past. It would seem, also, that the ability of Americans to help other countries depends largely upon their ability to understand and perceive accurately the nature of the socialization processes operating in these countries. Regardless of the political, cultural, and economic stature of any society, its ability to develop, maintain, and perpetuate itself depends upon the kinds of social learnings that are acquired by its members.

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CHAPTER VI

The Group as a Sociopsychological Setting for Learning

ROBERT D. BOYD

Over the past decade, concern has increased for the interrelationships among variables in small-group research. The need for explanation of the interplay of structures and processes in the dynamics of small groups has long been appreciated (Homans, 1950). There has been much evidence in recent years of the growing sophistication of researchers and research methods in being able to handle multidimensional aspects of small-group research (Hare, 1962; Golembiewski, 1962). The increased ability to account for variability of findings as a function of identified interacting variables has direct application to education. In the educational setting there is little control of the many variables operating in the learning situation; thus, it is necessary to understand their dynamic relationships.

In the theoretical phase, model building may offer direction to the solution of the problem of interacting variables. Three types of models hold exciting possibilities for untangling and giving order to the mass of accumulated data on small-group research: (a) the general systems theory, (b) the mathematical model, and (c) the electronic digital computer model. Noteworthy exemplars of the general systems theory are the works of Parsons, Bales, and Shils (1953), Homans (1950, 1961), Thelen (1959), and Heider (1958). A report on mathematical models was presented by Criswell and others (1962). The merits and possibilities of the electronic digital computer model were presented by Hare (1961) and Newell (1961). It is possible to combine the benefits of all three types; e.g., Gullahorn and Gullahorn (1963) combined certain basic propositions in Homans' work with an electronic digital computer model.

The contributions that models may make to the educator's understanding and effective and efficient use of small groups are in the speculative stage. It is assumed that when educators are able to have a relatively coherent and comprehensive understanding of the dynamics of the interrelationships of variables, they will be able to best use the findings in small-group research. Previous reviews of the literature appear to fragment the results rather than to give order and relationship to the findings. In an attempt to relate the findings of research, the author of this chapter organized the material into a simple paradigm. For the organization of the data on small-group research so that one may look at structure, process, and outcome rather than at isolated variables (concepts) such as leadership, a paradigm of input, operation, and output may be profitably employed. *Input* contains those variables that are seen as the component factors upon which groups are composed, such as the number of members, the nature of the task, and the personality of the members. *Operation* contains chosen variables that are seen as developing through the life of the group, such as role differentiation, norms, and leadership. Output contains those variables that are the product of the group, such as productivity, visibility, and status. Generally, research can be placed within one phase of the paradigm.

Input

The relationship between personality and behavior in groups has received much attention. The difficulty of predicting group behavior of individuals from personality inventories remains a difficult problem not only because of the difficulty of isolating and measuring personality traits but also because of the many variables in the group situation. Even the more obvious variables, such as nature of the group's task, leadership, and other personalities in the group, indicate the complexity of the task of prediction. Hare (1962) did an excellent review of the literature. Generally, central tendencies of personality do persist in group situations. Powell (1962) found that he was able to predict the ability of an individual to distinguish between the message content and the message source and to judge each on its intrinsic merit from premeasure of open-mindedness and closed-mindedness. This form of investigation seems most appropriate since it links personality variables to the nature of the group task. The difficulty of prediction identified by Couch and Keniston (1960) and Hare (1962) may in large part be minimized by directing personality studies within the particular structures of the group situation. Haythorn and others (1956a, b) found that both member behavior and leadership style varied significantly between groups having high scores on the Authoritarian Personality (F) Scale and those having low scores. Although much more needs to be done in this area, the obvious implication for education is that personality factors must be taken into account in the composition of groups, both in terms of the nature of the task and goals and in terms of the leadership given.

Age is an input variable. Ziller and Exline (1958) did not find any differences in the variable of age when interaction process categories were used. They found that in the male groups the older teachers talked more and in the female groups the younger teachers talked more. Toman (1963) found a greater frequency of conflict by sibling position in spouses where large age differences (12 years) existed. The research that has been done on aging and differences among age groups has not examined many of the assertions which have been raised in theory (Freud, 1922).

Another input variable is sex. Vinacke (1959), in his study of triad power relations, found certain marked differences between sexes which led him to conclude that the sexes differ significantly on certain behavior patterns in groups. He identified several of these based on a condition game problem he employed with triads. Borgatta and Stimson (1963) found differences between sexes on interaction process scores. They concluded that differences between males and females are of two types: (a) some variation in the factorial structure and (b) differences in amount of given categories of behavior. Subsequent papers, by Uesugi and Vinacke (1963) and by Vinacke (1964), substantiated the existence of significant differences in behavior patterns between males and females in small groups. Earlier research by Strodtbeck and Mann (1956) showed some differences between male and female behavior on the interaction process categories. They stressed that such differences should not obscure the determinative influence of the problem situation.

One of the crucial considerations in the input system appears to be the task. In large part, much of the reward system is directly or indirectly tied to the nature and demands of the task. The definition of a task is the definition of the subsequent group situation. Hoffman and Smith (1960) emphasized that the nature of problems used in research studies may directly elicit the role differentiations that are observed. They stated that each problem used in their study appeared to elicit certain types of reactions from group members, and these reactions differed from problem to problem. Hoffman and Smith concluded that personal attributes of individuals in a group should be examined after considerations of problem requirements and group characteristics. Zander, Natsoulas, and Thomas (1960), in a study of personal goals and the group's goals for its members, found that members who set their levels of aspiration more congruently with the group goals showed greater involvement in their group than did the members who set their levels of aspiration less congruently with the group goal. Such results as these have many implications for education. It is imperative that the nature of the task be clearly perceived and modified if necessary to be congruent with the educational objectives being sought.

Size of groups has concerned many researchers. Research results and theory have related size to such variables as resources of group members (Thelen, 1949), nature of task (Shaw and Blum, 1964), sex roles (Vinacke, 1959), and satisfaction (Thomas and Fink, 1963). Initial work in this area established that satisfaction decreases as number of members increases. As one would expect, the number of interactions per member decreases with increase in size of group, and the rate of giving information and suggestions increases as size increases. Recent work indicates that optimal group size appears to be five members (Slater, 1955). Thomas and Fink (1963) reviewed 31 empirical studies related to group size. They reported that many factors, such as distribution of participation and group organization, were found to be significantly affected by group size. They stated that methodological shortcomings prevented more inclusive generalizations. Notwithstanding, one may conclude that size is an important input variable.

Operation

Communication as one dimension of the operation phase of the analysis paradigm encompasses such factors as rate and type of participation, networks, feedback, and control. Mitnick and McGinnies (1958) found that the most active participants in discussions (on ethnocentrism) learned the most. A well-documented and integrated discussion of the research on communication and status in small groups was presented by Collins and Guetzkow (1964). Shaw and Blum (1964) investigated three conditions of feedback of satisfaction: no feedback, overt feedback, and covert feedback. In overt feedback, all subjects publicly signaled their satisfaction to the group. In the covert condition, satisfaction was signaled anonymously. Shaw found that performance was best in covert feedback, next best in overt, and poorest in the no-feedback condition. On the basis of his data, Zajonc (1962) was able to show that when mutual compensation of errors is not possible, individual and group performances are affected by feedback. It would appear from his results that individual and group performances are best under the feedback conditions when individuals have knowledge of (a) the group as a whole, (b) their own performance, and (c) the performance of other members. Zajonc's results show that individual performances do not change uniformly among group members. The slow performers were somewhat more sensitive to the difficulty of the group task, while the fast performers showed a stronger effect as a consequence of the type of feedback. Zajonc suggested that an individual's orientation to a group may be a predominant factor in his sensitivity to specific types of feedback.

Much has been done recently in the analysis of individual and group behavior through such perceptual constructs as dissonance theory, congruency, and self-conceptualization. The work on dissonance by Festinger and Aronson (1960) received much attention. The basic idea of congruency was set forth by such early workers in the field as Cooley (1902), Mead (1934), and Simmel (1955). Recent work on the concept of congruency by Backman and Secord (1962) showed that much of an individual's behavior may be explained by his concern with attempting to secure congruency in the interpersonal aspects of small-group operation. They stated that when congruency is not perceived as obtained, a person seeks resolution of the threat to congruency by one of the following means: (a) reducing interaction with those whose definition of his behavior threatens congruency, (b) misrepresenting the other's definition of his behavior to allow for the establishment or maintenance of congruency, and (c) changing his liking for the other by increasing it with congruency or decreasing it with incongruency. The significance of such research when applied to the instructional group is obvious. If there are no conditions for congruency on relevant issues, there is little possibility of establishing grounds upon which to build change. A question arises concerning the degree of congruency necessary and the areas in which it must be expressed. Some work was done on this question by Backman and Secord (1962). They found that the greater was the interaction, the greater was the likelihood for perceived congruency. Their data showed that liking and interacting are almost independent dynamics ($r=0.18$) when related to congruency. They suggested that generalized liking may overcome a state of specific incongruency.

Shaw and Penrod (1962) examined the nature of the relationship between amount of information and group effectiveness. They were able to show that information is linked to the recipient's attitude toward the information and the source of information. If the provider could validate or document the information, it was accepted. Such information was linearly related to influence and effectiveness. Individuals possessing influence based on validated information could give moderate additional information which resulted in increased influence. Too much additional unsubstantiated information decreased an individual's influence.

Homans (1961) stressed the importance of the reward system as a determinant of behavior. Leaders have been identified as one source of rewards. McClintock (1963) found that leaders make more positive affect responses (rewards) than do other members of a group. Support appears to facilitate interaction among those who generally find it difficult to enter into interaction; in this connection, Shaw (1960) demonstrated that a greater share in the group task leads to greater task motivation of group members. Miller and Hamblin (1963) reported that under conditions of high task interdependence a strong negative relation exists between the productivity of a social system and the degree of differentiated rewarding for relative achievement. Miller and Hamblin made a significant contribution to research by demonstrating that the cause of conflicting results on research dealing with cooperative and competitive tasks was due to lack of independent control of the differentiated reward and the interdependency of work relationship on the task. Rosenberg (1960) showed that a member does not change his behavor significantly unless the reward and punishment system is coordinated to his behavior. Reward alone appears to be insufficient. Zajonc's (1962) work showed that reaction time of experimental teams was inhibited when members received only knowledge of the group's success or failure and were given no feedback on individual performance. It may be that members not only have to receive rewards of an achievement type but also need to check their perceptions with others. The latter, of course, could be considered another form of reward.

Leaders may be part of the input system, but leadership is definitely an operation phenomenon. Fiedler (1962), reporting his findings regarding leader attitudes, group climate, and group creativity, reached the following conclusions: (a) leaders who perceive their least-preferred co-workers favorably tend to be most effective under pleasant and relaxed group conditions, while leaders who perceive least-preferred co-workers unfavorably are most effective under unpleasant, stressful group climates; (b) group creativity requires tension-free, nondirective leadership in pleasant groups and tension-free, directive leadership in more stressful, unpleasant groups. McClintock (1963) stated that leaders made fewer task-oriented responses, more positive affect responses, and fewer negative affect responses under group-support conditions than did other members. The commonly held assumption that leaders make significantly more task-oriented responses than other members was not supported by this research; McClintock suggested some very intriguing and possible explanations for this result. Hare (1962) suggested that the best rule for selection of leaders is to select the individual who has the necessary traits to satisfy the functions needed by the group. Bass (1960) gave a comprehensive and worthwhile discussion of leadership as a conceptual framework.

Considerable attention in the literature on small-group research has been given to the topic of *roles*. Findings of Hoffman and Smith (1960) appear to challenge the results of earlier work in role differentiation reported by Slater (1955), who found that greater role differentiation occurred as groups progressed. On the other hand, Hoffman and Smith found that role differentiation did increase to a point, but as the groups continued to meet, the index of role differentiation showed a disintegration. They concluded that different problems place different demands on individual members and that individuals react differently to different problems.

The Fifty-Ninth Yearbook of the National Society for the Study of Education (1960) contains one of the clearest presentations available to educators on the many sociopsychological dimensions of norms. Norms were subsumed under the conceptual framework of *power* by Collins and Guetzkow (1964), of *social control* by Hare (1962), and of *standards* by Cartwright and Zander (1960). Certainly, the central objective in the employment of the instructional group is facilitation of change. The research by Kiesler (1963) relates directly to this consideration. He found that attraction of the group for the individual decreased when the individual had a disconfirmed expectation and that attraction varied directly with the level of group acceptance of the individual.

Output

Output contains such outcomes as productivity, reward, satisfaction, visibility, and status. Although the study by Mann, Indik, and Vroom (1963) used an industrial setting, their methodological procedures could profitably be applied to certain educational settings. Measures of global satisfaction are difficult, if not impossible, to interpret (Collins and Guetzkow, 1964). Homans (1961) presented a discussion of rewards which has merit for the instructional group. In an investigation of visibility, Marwell (1963) concluded that there is some general characteristic of visibleness that operates regardless of content or frame of reference of the perceived. He found that self-image is significantly more accurate than other-image. The place and function of visibility and status have not been extensively explored in the instructional group.

Summary

The author of this chapter has attempted to report research that pertains to basic conceptual threads that have been woven into the study of the small, face-to-face instructional group. A paradigm was proposed to account for the dynamic relationships among variables, by structuring input, operation, and output phases. Within each of these phases were reported a selected group of recent research studies and new books in the field. The author's intent was to highlight some of the recent advances in small-group research as such research applies to the adult instruction group.

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CHAPTER VII

Materials, Methods, and Programs for Literacy Education

ROBERT F. BARNES

Research in adult literacy education is moving slowly through its initial stage of development. The research reviewed in this chapter represents the bulk of the research conducted and reported in this field. For the most part, the research conducted thus far has been done by persons directly involved with adult literacy education; very little has been conducted by persons from disciplines related to education.

Materials

Developmental

Publishers Weekly (1964) reported the findings of a U.S. Office of Education task force in a review and appraisal of existing instructional materials for adult literacy education. The task force found "a serious shortage of materials for teaching basic reading skills, especially word recognition skills." Most materials stressed a suggested basic vocabulary instead of recognizing the vocabulary already possessed by adults. The materials were not aimed toward the sophistication and interests of the intended reader, nor were they written on a functional level to aid in teaching the skills of practical grammar, letter writing, and good speech.

Kempfer (1950) surveyed 56 librarians and evening school principals in the United States, asking them, "At what grade levels of readability is there the greatest shortage of suitable reading materials for adults?" The upper elementary levels were mentioned most frequently. These librarians and principals felt that the areas of citizenship, homemaking, and family life and parent education exhibited the most acute needs. The validity of these results, which are somewhat out of date, depends a great deal upon how closely the librarians and principals worked with adults of low reading ability.

Dale and Tyler (1934) tried to discover the factors influencing the difficulty of reading materials. They used samples of personal health materials with groups of adults who had low reading ability. The number of different technical words in a selection was found to be the factor most closely associated with difficulty of comprehension. Next in line was the number of nontechnical words in the selection unknown by 19 percent of sixth grade pupils.

Field Testing

To test the basic fundamentals of reading and spelling, Levi (1964) used 204 subjects from Chicago, 128 of whom were adults with an average schooling of 5.8 years. After 99 hours of prescribed instruction, the mean difference between pretest and posttest scores of these adults was 4.6, with a standard deviation of 0.65. These figures must be interpreted cautiously, however, since it is not exactly clear what this gain represents. Two of the tests used had norms based on elementary school populations, and no effort was made to utilize a control group.

A more structured experiment was conducted by Henney (1964b), who used the Family Phonics System with 30 inmates of a penal institution. These subjects were divided into three groups: a control group, an experimental group that received one-to-one tutorial instruction, and an experimental group that received group instruction. He found that 20 one-hour sessions increased reading ability by as much as 2.5 grade levels for the functionally illiterate inmates and that it made little difference whether the teaching-learning situation was on a group or on a one-to-one basis.

Another experiment conducted in a reformatory was directed by Allen (1961). The Laubach literacy films were used for instruction of 288 inmates, 108 of whom graduated from the program. The showing of the films required 49 hours, and extra sessions were used for classroom instruction, review, practice, and drill. The subjects had a claimed median educational experience of 5.8 years but a mean measured educational achievement score of 1.97. Those completing the course increased an average of 2.5 grades in reading, vocabulary, and spelling. The results must be viewed with caution since the sampling technique used was unidentified, no control group was used for comparison, and the test instruments had norms based on school children. Also, the results from the two previous field test efforts cannot be generalized because of the confined population.

Henney (1964a) again tested the Family Phonics System and apparently did not limit it this time to a penal institution setting. The improvement in scores ranged from 3.5 to 7.4 grade levels after 160 hours of instruction, and he reported a significant difference between the gains in reading ability of the members of the experimental groups and the gains of the control group. The results of this field test can be questioned because of the following limitations: the test instruments, the lack of a description of the control group, the apparent absence of any attempt to select a random sample, and the apparent absence of any effort to match the experimental and control groups.

Additional References: Cass (1960); Moore and Hendrickson (1958); Neijs (1961); Ward and Brice (1961).

Methods

The interim report of the Norfolk experiment directed by Cooper (1964) relates the use of team teaching with four closely matched groups of "hard-core unemployed," the majority of whom did not pass the *General Aptitude Test Battery*. The main experimental group was given intensive instruction both in general education and in technical training; the subsidiary experimental group received only technical training. The main control group was tested only at the beginning and end of the project, while the subsidiary control group received guidance and occupational information on a bimonthly basis to test the Hawthorne effect. The intermediate results reported by Brooks (1964) showed that 90 of the 100 men in the two experimental groups graduated, and all of the graduates were placed on jobs, most in their respective fields.

Peerson (1961) directed an experiment that involved televised instruction of illiterates with Laubach's *Streamlined English* and supplementary materials. Classes utilizing direct teaching were organized for those areas having poor television reception. One-fifth of the group of 608 subjects had a minimum of five years of schooling, and one-fifth had had no previous schooling, so the typical grade level was two or three years. After approximately 98 hours of televised instruction and review sessions, the groups were given a standardized test to compare these adults with a national norm of school children. On most levels adults' results compared with children's results about half way through the second grade. The data suggested that "television teaching is less effective than the person-to-person procedure in developing the skills of connected reading." Using these same televised lessons with Laubach materials, Holst (1959) reported the results of tests given to 61 enrollees. The total group was composed of interested home viewers and students enrolled in 31 Memphis centers. The average grade level achievement scores were at the 2.5 grade level or above, with the total average achievement at 2.8. However, no pretest scores were used, and a description of the sample was not given. The programming method was tried with adult illiterates by Crohn (1964). Intermediate data indicated a need for further training in visual discrimination and an increase in the use of context as stimuli support.

As a result of a 1955 survey of 30 programs, Cass (1956) identified some common problems of administrators, successful methods and techniques, training and recruitment practices, and a general overview of the structural organization of basic adult education programs.

Additional References: Hilliard (1963); Olson (1963).

Service and Agency Studies

Since very little knowledge had accumulated on the actual performance of the uneducated group of inductees during World War II, Ginzberg and Bray (1953) chose a representative sample of 400 from the 303,000 illiterates received by the Army for training in basic literacy subjects. The typical trainee came from a community of under 5,000 persons, had completed more than four years of schooling, was single and self-supporting, and gave no evidence of having ever broken the law. Of the 400 selected, 343 graduated from this basic program. The evaluating criteria emphasized length of service, type of discharge, amount of time lost for medical and disciplinary reasons, and time of discharge (before or at the normal termination of his period of service). Of 331 graduates, 38 percent were rated good or very good in performance, 49 percent performed acceptably, and only 13 percent were considered a loss to the Army. In addition, about 50 percent of these graduates applied to the Veterans Administration for educational benefits after leaving the service.

Altus (1950) was interested in the relationship between vocabulary and literacy when intelligence is constant. He administered several tests to 156 illiterate soldiers whose mean IQ for all eight reading levels was 77, ranging from 75-79. He found that literacy and vocabulary were somewhat related, "though the effect of one upon the other appears to operate in rather narrow limits."

Brooks (1963) directed a study to determine the literacy level of people receiving public aid even though physically able to work. The sample consisted of 680 adults on relief, most of whom were Negro women from broken homes with a median grade completion of 9.5 years. Only 6.6 percent had not completed five years of schooling. However, when a standardized test was administered to each and the scores were compiled, 50.7 percent of the total sample scored below or at the functionally literate level (fifth grade reading ability).

Additional References: Altus (1950); DeGabriele (1961); Hertert (1963).

Conclusions

From the lack of basic and applied research in adult literacy education, and from the tremendous emphasis now being placed upon this aspect of education, it is apparent that without a great deal of further sound research this field will continue to be little more than the present conglomeration of hit-or-miss programs. Well-designed research is badly needed in such related areas as sociology and anthropology so that teachers and administrators in the field may better understand the illiterate adult, his environment, and his society. Research is needed, too, in areas such as learning, motivation, teaching methods and techniques, and teacher training techniques.

The reviews of field testing that have been completed and reported point up a need for a sound design strategy for future field testing of instructional materials. Instructional materials must be developed to meet the needs of the adult illiterate. Finally, it appears that there is a real need to identify accurately the functionally illiterate segment of the population.

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CHAPTER VIII

Procedures and Methods for Community and Resource Development

JOSEPH L. MATTHEWS and LINNEA B. HOLLAND

If the aim of education is to bring about a change in the behavior of the learner, then adult education is one method of changing behavior in line with the objectives of the community development effort. It follows also that the total of community development is more than adult education and it functions in the context of social, economic, and physical forces that prevent its being conducted or evaluated in isolation from the milieu. In an attempt to decide whether community development is or is not education, Miller (1964) wrote that it is often difficult to see any educational process in much of the activity called community development. However, educational method is involved to the extent that the worker in the field tries to help the people of the community learn problem-solving processes.

The limited amount of research on the community development process is probably a result of the complexity of the research problem, the paucity of resources for this kind of research, and the prevalence of adult educators who do not feel they need to develop a theoretical base for their programs. Although the quality of research varies widely, only a limited amount meets standards for social science research. According to Bealer and Fliegel (1964), most of the research on planned change in the community development setting has been done by American rural sociologists whose innovation and adoption research was related to processes by which cultural change spreads in a society. Sanders (1964), in analyzing community development in a sociological perspective, concluded that large-scale community development requires a theoretical knowledge of group action processes on the part of leaders and planners.

The term *community development* is used to mean one or more of several different concepts. According to Sanders (1964), it is used in the sense of (a) *process,* with emphasis on what happens to people and their social life; (b) *method* or *means* to improve agriculture or raise health standards; (c) *formalized program,* such as a national community development plan; and (d) a *movement* to which people are emotionally committed or a *cause* to which they are dedicated.

Leadership and Training

Several studies attempted to identify top influential community members and to isolate characteristics that distinguished leaders from others.

Brown (1963) found that women leaders were well educated, knowledgeable about adult education, and willing to help increase educational opportunities for women in their communities. Studying influential Negroes and Negro organizations, Barth and Abu-Laban (1959) found that the Negro subcommunity lacked large-scale business and industrial organizations and that Negro leaders were primarily concerned with issues of an interracial nature. Auerbach (1961) and Mulford (1962) noted that the "power elite" formed a cohesive social group and interacted more with fellow leaders than with other community members. Danzig (1959) identified 11 motivations which were acknowledged as conscious desires for the assumption of leadership positions.

While training of community leaders would seem to be rather crucial, there was little genuine research in this area. Franklin (1959), working with 14 university consultants, compared three training methods and found three major obstacles to better training: (a) lack of interest in or need for training expressed by the leaders; (b) tendency to study things and projects rather than people and processes; and (c) antidemocratic values and rigid perceptions held by the trainees. Devereaux (1960) noted a relationship between community leadership, socioeconomic status, and certain other correlates of education, occupation, prestige, values, and attitudes. Vested interests and a proliferation of roots locally increased leadership involvement.

Group Behavior

An understanding of the changing group structure of both rural and urban communities is a necessity for the adult educator engaged in community development. Lindstrom (1961) studied interest groups in which farm people participated and found that most had sociocultural linkages. He stressed the need for intergroup cooperation on the community level. Alpert and others (1960) attempted to determine causes behind the apparent lack of community group participation in federal high-rise housing projects, and Young and Mayo (1959) studied manifest and latent participants in a rural community action program. Alpert found that residents with low income and recipients of public assistance tended to participate less than did persons from other income groups. Although willing to get together to solve existing problems, they were not willing to participate in the one existing community action group because it had no recognition or authority from the project management.

While Young and Mayo also found socioeconomic status closely related to level of participation, they felt that inactivity in community programs did not necessarily reflect unfavorable attitudes or even apathy, but demonstrated a lack of understanding or knowledge of the organization. A similar finding was expressed by Folk (1962), who studied organized community groups and their impact on the schools. Although groups were interested in bringing about improvements in the educational program, they depended on the school to furnish leadership. Davis (1960) found that citizens did not have the information they needed to make rational decisions about educational matters for which they were responsible and that positive relationships were found between public knowledge and attitudes.

Professional Aspects

What is the function of the professional in community development? What type of education or training does he need? Much has been written on the professional community leader, but most of it has been in the form of conjecture or opinion; very little has been based on research. Several studies were made by cooperative extension personnel. Kalangi (1963) concluded that (a) urban extension agents required more training in sociology than their rural counterparts and (b) both groups needed considerable training in community development, public speaking, and written communication. Ferver (1961) concluded that those extension directors who were well rated by administration on the basis of their agricultural programs could be equally successful in a broadened community development role if trained and given time to make the role transition.

In a study of the community development approach as a vehicle for adult education in cooperative extension, Dickson (1959) found that professionals aided citizen groups in (a) studying community resources and outside resources available to it, (b) identifying and evaluating community problems, (c) making decisions about community goals and objectives, (d) developing plans of action to achieve goals and objectives, (e) organizing citizens to expedite action on plans, and (f) evaluating progress and accomplishments.

Social Action and Change

Major problems in community-related research are the instigation and measurement of social change. A helpful study by Andrews, Bauder, and Rogers (1960) established benchmarks for rural industrialization and developed hypotheses to be tested later. Johnson and Wilkening (1961) and Hardee (1963) reported on separate five-year studies in which substantial changes occurred as a result of educational programs. The personalized approach was found to be most effective in influencing part-time farmers.

The successful use of a community development contest as a catalytic agent for social action was described by Holik and Lane (1961). This method allowed discussion of various subgroup interests without emotional involvement. The introduction of the program from the outside eliminated the suspicion that someone was trying to gain a vested interest, and the award became the primary group action goal.

One of the better studies of social action was done by Sanders (1961), who made a case analysis of community controversy on the issue of fluoridation and described a series of stages which led to community decision. The stages included (a) initiation, (b) preproposal, (c) proposal, (d) community action, (e) decision, and (f) aftermath. Sanders found that the professional initiators (e.g., dentists, public health officers) were usually unprepared for the political leadership required in the community action stage.

Attitudes, Views, and Beliefs

The desire to improve or to develop resources depends to some extent on the attitudes, views, and beliefs prevalent within the community. Folkman (1962) noted that chronic low income was more closely related to the system of attitudes and values than to limited employment capabilities, while Burman (1959) found interest in intellectual development virtually nonexistent among adults on lower socioeconomic levels, although interest in vocational training was evident. Press and Hein (1962) found that the need for orderly development in a rural Michigan township adjacent to a metropolitan center was considered to be the least urgent by the key group (commercial farmers) that had the power and organization to initiate action. Porter and Lyon (1963) studied attitudes, opinions, and levels of understanding of cooperative extension staffs regarding development of rural areas. The staffs considered (a) the creation of public awareness and understanding of the program and (b) the development of local leadership as the two most serious obstacles.

Procedures

Some attention has been given to the problem of useful procedures. Beers (1959) presented 13 propositions in a theory of motivation for community organization.

Community development clubs have been initiated in several locations. Those in Alcorn County, Mississippi, were studied rather thoroughly by Baird and Bailey (1960) and again by Cole and Kaufman (1961). Two distinct stages in the growth of community clubs were identified by Baird and Bailey; variables affecting their success were isolated by Cole and Kaufman, who found that the presence or absence of such groups within a community seemed to depend more on a relatively high socioeconomic level than on numbers of families. A long history of interaction within a neighborhood was closely related to subsequent growth and success of community development clubs.

Community Resources and Needs

How can needs be determined? How do communities perceive their own needs? What resources are available for meeting needs? Several researchers attempted to find answers to these questions. Aiken (1963) designed a model for assessment or critical analysis of community situations. Gambill (1961), using seven different survey techniques, successfully designed and tested a method for determining needed community services in Georgia. Public affairs interests were studied by Brown (1961) and by Hazlitt, Boone, and Matthews (1960). Concern was expressed in regard to industrial development, employment opportunities, and school facilities in the survey made by Brown; while Hazlitt, Boone, and Matthews found about three-fourths of the respondents interested mainly in public affairs and other liberal subjects and in more opportunities for this kind of adult education. Community facilities and resources were also studied by Williamson (1958), McKinney and others (1961), and Douglas and others (1963). While the focus varied from study to study, it was generally found that many small communities lacked both financial resources and demands for nonvocational adult education and that local government was perceived as being inefficient or too small or both.

Evaluation

Does involvement in a community study or project have any lasting effect on the participants? Three separate studies indicate that it does. Duncan (1961) found that active student participation in organized college activities was directly related to subsequent involvement in community organizations. Both Mitchell (1960) and Hollenbeck (1959) found increased interest in education and greater citizen participation following earlier involvements in community survey or study programs. Caldwell (1961), on the other hand, in assessing the effect of a university-sponsored development study, found that many people were not well acquainted with the public school program. Because of only partial success in the action phase, the most important recommendations of the study group were not implemented, while some of the less important ones were accomplished.

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CHAPTER IX

Clientele Analysis

ALAN B. KNOX

During the past decade, adult education research and studies categorized as clientele analyses became a major segment of all research in the field. A clientele analysis is a description of the characteristics of the participants in adult education programs of one or more agencies in comparison with the characteristics of the general population of adults who could potentially be served. The characteristics frequently used for comparison include age distribution, proportion of men, level of education, program interests, marital status, and occupation. The participating adults were often compared with the total potential constituency, as defined by the agency in terms of geographic area and eligibility requirements. Three approaches have been made to clientele analysis. One approach compares the characteristics of adult education participants in all agencies with nonparticipants on a national or regional basis. The second approach analyzes the characteristics of participants within a type of agency, such as a school or university or library. The third approach describes the participants in one agency in a specific community. Studies using the third approach have been most numerous and, in general, methodologically least rigorous. However, they have served several important functions: (a) confirmation of more general research findings, (b) indication of variability within a type of agency, and (c) direct contribution of the findings to administrative decision making within the agency in which the clientele analysis was conducted.

Clientele analyses are an important segment of adult education research for these reasons: (a) since so many modest clientele analyses have been conducted, a review of the most rigorous clientele analysis research can encourage more effective studies; (b) clientele analysis findings can indicate the degree to which target audiences are being reached; (c) clientele analyses can provide evidence for more effective counseling and teaching of the adults being served and for more effective program development and promotion to reach other adults; (d) clientele analyses can encourage greater interagency coordination by indicating how each agency can best complement the other's activities in terms of audience reached; (e) clientele analyses can contribute to theory related to sociology of education. The voluntary nature of most adult education participation allows an examination of relationships between characteristics of agencies (such as image, subject matter, educational method, and promotion) and characteristics of the client system that is attracted.

Characteristics of Adult Education Clientele

Johnstone (1965) conducted the most recent and detailed national study of the characteristics that differentiated adult education participants in all agencies from nonparticipants. A statewide study by Knox and Videbeck (1963) and a citywide study by London, Wenkert, and Hagstrom (1963) provided supplementary information. The integrative reviews of prior research on clientele analysis by Verner and Newberry (1958) and the chapter on participants by Brunner and others (1959) indicated how the characteristics of adult education participants differed from those of nonparticipants. Because the most detailed and representative data were provided in the National Opinion Research Center (NORC) study by Johnstone (1965), *Volunteers for Learning* has served as the primary source for this chapter; the remaining studies were used for elaboration and interpretation.

The Johnstone study data were collected in interviews with a representative national sample of 24,000 adults. Adult education was defined as participation, as a part-time student, in an activity organized around some form of instruction of which the main purpose was to learn or acquire some sort of knowledge, information, or skill. The purpose of the study was to determine who participated in what types of adult education programs and for what reasons. The data from this well-designed study have made possible the most detailed and accurate analysis to date of the adult education participant.

The study by London, Wenkert, and Hagstrom (1963) was conducted in Oakland, California. Its primary purpose was to analyze social class differences in attitudes toward and participation in adult education by Oakland men, aged 20-59, who resided in neighborhoods representative of men in all but the lowest and highest income categories. Generalization from the clientele analysis section was accordingly restricted. Data were based on a community survey of 2,708 interviews and on a more intensive matched sample survey of 203 adult education participants and 389 nonparticipants.

The study by Knox and Videbeck (1963) was based on interview data from an area probability sample of 1,500 adults, a representative cross section of the total adult population of Nebraska aged 21-69. One purpose of this Baseline Study of Adult Participation was to compare the adults who had participated in adult education during the prior year with those who had not. This statewide study was similar to the Johnstone nationwide study in sample selection, interview questions, and research procedures.

Data on several demographic variables in the three studies were reported in a form that allowed comparison. These data provided a basis for testing generalizations made in the earlier review by Brunner and others (1959) that adult education participants had more formal education, higher status occupations, and more income and were younger than nonparticipants. The rate of participation was lower for rural than for urban residents and was especially low for small-town dwellers.

Table 1 presents data that indicate the tenability of the earlier generalizations regarding the general clientele of all adult education. The best current estimate is that 15 percent of the adult population participated in some agency-sponsored adult education program during the past 12 months. There appeared to be no substantial difference between men and women or between married and single persons in gross rate of participation. The data from the studies by Johnstone and by London, Wenkert, and Hagstrom indicated that the participation rate declined with age. However, the life-cycle analysis by Knox and Videbeck demonstrated that when variables such as level of education and life circumstances were accounted for, most of the age-related differences disappeared. The positive relationship between adult education participation and level of occupation, income, and education was demonstrated by all three studies; however, the highest degree of association was with level of formal education. Both the Johnstone and the Knox and Videbeck studies showed a positive relationship between community size and rate of adult education participation.

Agency Differences in Clientele

As was pointed out in the chapter on participation by Brunner and others (1959), there is an interrelationship between the clientele of an adult education agency and agency offerings. Johnstone (1965) demonstrated that different types of agencies offering comparable adult education programs attracted different audiences.

Table 2 indicates the proportion of all adult education sponsored by each type of agency, as classified by Johnstone, and the major subject matter areas offered by each type of agency. Based on the Johnstone study, 21 percent of adult education was sponsored by colleges and universities, 12 percent by schools, and 4 percent by the military. The somewhat different distribution in the London, Wenkert, and Hagstrom study seemed to be associated with the all-male sample. The distribution of sponsorship in the Knox and Videbeck study was similar to that in the Johnstone study. The generalization that adult education was primarily occupationally related was clearly supported. For all sponsors, except churches and community organizations, courses classified in the vocational subject matter area constituted a major portion of the offerings. In general, the degree of agreement among the three studies regarding the major subject matter areas offered by the various types of agency was exceedingly high.

During the period between 1959 and 1964, the largest number of published clientele analyses was conducted in college and university adult education programs. Table 3 presents data regarding participants in college and university adult education programs, based on the Johnstone study, along with data from five other studies that indicate variation within this type of agency.

TABLE 1. Percent of Adults Within Various Demographic Categories Who Had Participated in Any Adult Education Activity During a Twelve-Month Period

Demographic Categories	**NORC** Johnstone *	**Oakland (men)** London, Wenkert, and Hagstrom *	**Nebraska** Knox and Videbeck *
Total Adults	20% **	12%	12%
Sex:			
Men	21	12	12
Women	19	—	13
Age:			
20-29	29	20	9
30-39	25	15	13
40-49	21	10	20
50-59	16	7	10
60 or over	14	—	1
Marital Status:			
Married	21	12	13
Single	21	16	7
Occupational Type:†			
Professional	45	22	33
Managerial	25	16	16
Clerical-Sales	27	16	15
Craftsmen-Foremen	26	6	13
Operatives	13	12	4
Service	19	10	7
Laborers	9	10	6
Income:			
$4,000 or under	12	11	—
$4,000-6,999	20	12	—
$7,000-9,999	27	14	—
$10,000 or over	32	15	—
Education:			
8 Years or Less	6	5	6
9-11 Years	15	8	8
High School Graduation	24	10	11
13-15 Years	36	21	17
College Graduation	39	23	30
17 Years or More	47	—	35

* The percentage rate of participation is adapted from data presented by Johnstone (1965); London, Wenkert, and Hagstrom (1963); and Knox and Videbeck (1963).

** Five percent of adults in the NORC study were engaged in independent study. Fifteen percent were enrolled in agency-sponsored programs. The Oakland and Nebraska figures include only those adults enrolled in agency-sponsored programs.

† Categories conform to U.S. Census definitions.

TABLE 2. Comparison Between Major Types of Sponsoring Institution Regarding Percent of Courses and Major Subject Areas

	Johnstone * **NORC**			London, Wenkert, and Hagstrom * **Oakland** (men)			Knox and Videbeck * **Nebraska**		
Sponsoring Institutions	Percent sponsored by type of agency	Percent by subject matter area **		Percent sponsored by type of agency	Percent by subject matter area **		Percent sponsored by type of agency	Percent by subject matter area **	
		Major	Minor		Major	Minor		Major	Minor
Colleges and Universities	21%	Voc. 39%	Gen. 38%	26%	Voc. 40%	Gen. 33%	19%	Gen. 43%	Voc. 31%
Churches	21	Rel. 86	Rec. 4	9	Rel. 87	Pub. 7	9	Rel. 69	Pub. 13
Community Organizations	15	Rec. 38	Fam. 16	6	Rec. 38	Pub. 10	17	Pub. 38	Per. 22
Elementary and Secondary Schools	12	Voc. 41	Fam. 19	18	Voc. 51	Gen. 29	19	Voc. 28	Fam. 28
Business and Industry	12	Voc. 79	Per. 5	8	Voc. 78	Gen. 11	20	Voc. 73	Per. 11
Government †	7	Voc. 42	Fam. 26	0	0	0	6	Rec. 45	Voc. 27
Private Schools	7	Voc. 39	Rec. 38	9	Voc. 63	Rec. 17	1	0	0
Military	4	Voc. 52	Per. 11	8	Voc. 62	Pub. 19	4	Voc. 43	Per. 29
Other	1	0	0	16	0	0	5	0	0

* Data is from Johnstone (1965); London, Wenkert, and Hagstrom (1963); and Knox and Videbeck (1963).

** Major subject matter areas were classified within categories used by Johnstone: Vocational Studies, General Education, Recreation and Hobbies, Family and Home, Religion, Personal Development, and Public Affairs.

† Cooperative Extension Service is classified within the Government category and constitutes the major portion of programs so classified.

TABLE 3. Percentage Distribution of College and University Adult Education Participants Based on Several Studies

Characteristics	General Adult Population	NORC College and Univ.	National Survey	Wash. Univ. Evening College	Buffalo Graduates	Illinois Extension	UCLA Liberal Education
Men	47%	57%	66%	74%	90%	—	38%
Age:							
Under 35	31	54	73	79	92	55%	—
35-54	41	39	25	19	8	40	41
55 or over	28	7	2	2	—	5	—
Education:							
Elementary	59	1	1	3	—	8	3
Secondary	25	24	22	32	—	32	13
College	16	75	77	65	—	60	84
Married	76	—	—	52	—	74	71
Occupational Type:							
Professional	11	—	—	24	8	56	66
Managerial	8	—	—	—	15	10	24
Clerical-Sales	22	—	—	—	23	—	—
Income:							
$1,999 or under	13	—	—	6	3	—	—
$2,000-4,999	29	—	—	26	35	—	—
$5,000-7,999	32	—	—	33	45	—	—
$8,000 or over	26	—	—	16	17	—	—
Organizational Memberships:							
None	25	—	—	42	—	—	21
1	22	—	—	23	—	—	20
2	18	—	—	13	—	—	13
3	14	—	—	8	—	—	21
4 or more	21	—	—	9	—	—	26

Source: Beginning with the NORC study (above), data are drawn respectively from the following: Johnstone (1965); Knox and Sjogren (1965); Wientge and DuBois (1964); Zeman (1960); Carter, Kerr, and York (1962); Hill (1960).

* Data from Johnstone (1965).

** Data from U.S. Bureau of the Census, 1960.

† Data from Knox and Videbeck (1963).

Data regarding the remaining types of agencies are presented in Table 4. The community organization category within Johnstone's study includes programs sponsored by YWCA's, women's clubs, and libraries. An exceedingly well-designed clientele analysis by Davis and others (1961) provided data on Great Books participants, a program closely associated with libraries. Studies by Wasinger (1961) and LeVine and Dole (1963), designed primarily to identify salient enrollment determinants, provided data for comparison with the Johnstone data for elementary and secondary

TABLE 4. Percentage Distribution of Adult Education Participants in Several Types of Agency

		Community Organizations		Elementary and Secondary Schools						
Characteristics	Churches	NORC	Great Books	NORC	Iowa	Hawaii	Business and Industry	Govern-ment	Private Schools	Military
Men	35%	32%	37%	35%	24%	—	74%	53%	43%	92%
Age:										
34 or under	34	40	—	47	38	50%	40	38	46	73
35-54	42	45	—	46	53	35	53	48	48	27
55 or over	24	15	—	7	9	15	7	14	7	0
Education:										
Elementary School	20	6	—	8	20	30	5	10	4	2
Secondary School	53	49	16*	63	52	70**	54	49	57	60
College	27	44	84	29	28	—	40	41	39	37
Occupational Type:										
Professional	—	—	65†	—	8	9	—	—	—	—
Managerial	—	—	20	—	—	4	—	—	—	—
Clerical-Sales	—	—	10	—	10	11	—	—	—	—

Source: Beginning with the column marked "Churches," data is, respectively, from the following: Johnstone (1965), Johnstone (1965), Davis and others (1961), Johnstone (1965), Wasinger (1961), LeVine and Dole (1963). The last four columns are all from Johnstone (1965).

* Total includes participants who attained high school graduation or less.

** Total includes participants who attained high school graduation or more.

† Occupational distribution is for men only.

school programs. The data for the remaining types of agency were from the study by Johnstone.

In general, every type of agency was reaching some adults in almost every population category, but the modalities were quite different. The college programs included the highest percentage of young adults and men, with the exception of programs by business and industry and by the military. The high proportion of young men was most marked in an analytical study by Zeman (1960), based on persons who had completed an undergraduate degree through the University of Buffalo adult education division and to a lesser extent in the credit and degree oriented clientele at Washington University, described in the study by Wientge and DuBois (1964). An intermediate sample, in terms of proportion of young male participants, was described in the national survey of evening class students conducted by Knox and Sjogren (1965). The Illinois Extension Study by Carter, Kerr, and York (1962) described participants in the more heavily noncredit and off-campus programs that constituted a substantial portion of the programs included in the college category by Johnstone. The highest proportions of women, older adults, and adults with higher levels of education, occupation, and organizational participation were included in the clientele attracted to the noncredit liberal education program described by Hill (1960) in his study designed primarily to compare lecture and discussion methods. The striking consistency in the characteristics of adults attracted to noncredit liberal education programs sponsored by universities and libraries was pointed out in the studies by Hill (1960) and Davis and others (1961); the synthesis of research related to the audience for liberal adult education was noted by Knox (1962).

The highest proportions of older adults were being reached by adult education programs sponsored by churches, community organizations, some school systems, and the Cooperative Extension Service. The highest proportions of adults who had completed some college work were being reached by colleges and the Great Books programs; while the highest proportions of adults who had not graduated from high school were being reached by the churches, some school systems, and the Cooperative Extension Service. Abstracts of published and unpublished adult education clientele analyses, describing procedures and findings, were prepared by Knox and Hall (1964).

Conclusion

Recent adult education clientele analyses have demonstrated that adult education participation was distributed broadly throughout the adult population and that there were great differences in rates of participation by adults in various demographic categories, related primarily to level of education. Major sponsoring agencies varied substantially in the adult education programs that they offered and in the characteristics of adults whom they attracted, but there was substantial overlap. The consistency with which similar programs regarding subject matter and methods attracted the same clientele, regardless of agency sponsorship, was demonstrated in the case of noncredit liberal education study discussion programs. The effectiveness with which some programs within each type of agency attracted some adults indicated that most adult education agencies could attract almost any target audience if appropriate approaches to program development and promotion were utilized. The studies reviewed in this chapter provided important references for use by adult educators in the design and interpretation of clientele analyses in their agencies.

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CHAPTER X

Needed Research

BURTON W. KREITLOW

The giant steps so needed in adult education research are yet to be taken. A study of the preceding chapters of this issue showed important contributions but also a lack of structure and theory which could have been used to launch new research and to integrate that which had been completed. In Chapter V, Jensen and Schrader developed a schematic description of adult socialization; in Chapter VI, Boyd provided a paradigm on small-group research. These structures were helpful in organizing completed research and can be used as a base for the theory and research development they suggest. Overcoming the general lack of structure was the express purpose of a project reported by Kreitlow (1964). The reported schema of research need was used as a base for analyzing Chapters I-IX. This structure provided the basis for the identification of research priorities identified in this chapter.

The need for the development of rigorous structures and models in adult education research has been dramatized by the progress made when they are present. For example, studies of diffusion, innovation, and adoption began with models for studies of adoption patterns among farmers and became a useful approach in such other fields as medicine and engineering. The production of knowledge subsequent to the establishment of a research model is noted by Rogers' (1962) 52 generalizations based on innovation studies and a 600-item bibliography. On the basis of reports by Rogers (1962), Fliegel and Kivlin (1962), and Lionberger (1961), it can be concluded that the models and extensive studies completed in this area of adult education research make possible the first trials of computer simulation and more valid predictions of change and adoption than heretofore possible.

Schema of Research Need

Kreitlow (1964) established a structure of research need which included contributions in the field to be made by scholars in related disciplines and those working from an interdisciplinary base. Of prime concern is the contribution of the sociologist and anthropologist to knowledge of the adult's response to sociocultural phenomena. Of equal concern is the product of the psychologists' and educational psychologists' efforts to learn more of the adult as an individual and a learner. Research related to the level of practice in adult education—administration, clientele, programming, and instruction—has had and will need researchers intimately acquainted with that practice. It can be concluded from the studies reported in this issue that much is being accomplished, but the additive qualities found in research based upon well-established models are still lacking. Promising examples of models are beginning to appear, such as those on processes by Verner (1962). In contrast, the limited research on adult literacy education so completely documented by Barnes in Chapter VII shows that researchers in this area have no existing or proposed model around which to develop or organize findings.

Needed Research

Identification of needed research reported by Kreitlow (1964) was based on a systematic review of recent literature in adult education and related applied fields and disciplines: interviews with 34 national leaders; and analysis of *Adult Education: Outline of an Emerging Field of University Study* by Jensen, Liveright, and Hallenbeck (1964). An early draft of Kreitlow's report was analyzed by a research conference called by the Adult Education Branch of the U.S. Office of Education. On the basis of the above and Chapters I-IX of this issue, the author has listed research needs in two sections: (a) priority needs and (b) other significant needs. Examples of basic and applied research and suggested development projects are presented for the first two priority needs.

Priority Research Needs

Each of the priority research needs listed in Chapter X and others suggested in Chapters I-IX can be placed in an appropriate segment of Kreitlow's schema. There are problems and research proposals made that do overlap from one category to the next. It is up to the researcher to clarify the basis of his choice of category for a specific research problem.

1. By what means can the educational, technical, scientific, and cultural illiterate be educated for economic and social self-sufficiency?

A. Basic Research.
Determination of the concepts, skills, and abilities basic to self-sufficiency in modern society
Determination of the goal and value base of those at different literacy levels
Development of models for changing the illiterate's perception of himself and society around him.

B. Applied Research.
Testing of instructional models with groups varied as to level of literacy (goals and values, level of living, etc.) and determination, through in-plant studies of patterns of behavior required by automating industries.

Comparison of adults of the same literacy level with variability in their degrees of self-sufficiency

Investigation of instructional models aimed at developing a more positive attitude toward work.

C. Development of Demonstration Projects.

Development of demonstration projects jointly with industries undergoing major technical changes to show the effect of a rising level of literacy on technical adaptability

Demonstration of how groups affected by automation can be identified in advance and retrained on the basis of their identifiable needs.

2. What are the most appropriate conditions for adult learning? What are the personal (internal) and social (external) factors that lead to changed behavior in adults?

A. Determine whether there is a physiological basis for a different instructional approach with adults at different stages of the life span. Consider also the psychological basis, sociological basis, etc. Conduct studies to identify barriers to learning (psychological, sociological, physiological) at different stages of life and comparative studies (youth and adults) on the attainment of concepts in controlled learning environments. Conduct studies on problem solving, skill attainment, and changes in the affective domain. Determine the factors in the life span of an adult which most affect his initial acceptance of learning. Determine the varying influence of the source of instruction on the willingness of the adult to learn. Develop hypotheses on critical incidents that lead to change by use of biographical investigation of adults known to have sharply altered their behavior. Determine variables of language usage that affect abilities related to achievement in skills, concept attainment, etc.

B. Determine how an adult's level of aspiration affects his participation in learning activities. Investigate the effectiveness of learning under controlled conditions where the setting is varied; for example, teaching technical skills in the factory, in the factory shops, in a public technical school. Study change among adult groups of different personal and social background. Study the effectiveness of selected procedures for inducing change among groups with common social and/or personal characteristics. Identify variables in groups of adult illiterates that relate to selected behavior changes.

C. On the basis of what is already known about conditions for maximum adult learning, establish settings in each of a number of adult education agencies where the conditions are met and can be observed. Demonstrate promising procedures noted above in a total program of change on a community or institutional base.

3. Under what conditions can a teacher be most effective in motivating and stimulating adults to accept change? What communication variables relate to acceptance of change?

4. In what ways can the existing socioeconomic and cultural information be used effectively in planning and conducting programs of continued learning?

5. What are the factors of sociocultural change that most influence learning? In what areas of human concern are educator-induced social actions useful? In what ways can positive action be stimulated? What is the nature of community dynamics; how can it be harnessed to influence learning?

6. Who are the participants in adult education? What has been the quality and quantity of participation in the past? What is it likely to be in the future?

7. What resources within the instructional group can be used to maximize the achievement of individual and group objectives?

8. What are effective means of achieving competency in one's life that is satisfactory to family, social group, community, vocation, and one's role as an individual?

Other Research Needs of Significance

1. What factors prompt adult participation in learning activities (individual or group), and what are the means by which these factors are internalized?

2. In what ways can knowledge of adult attitudes be used to change, develop, or guide programs of continued learning?

3. In what ways can knowledge of adult interests be used to improve the quantity and quality of participation in adult education programs?

4. What are the characteristics of personality change in the adult years; what factors influence the change patterns; and in what ways can knowledge of these factors be applied in programs of continuing education?

5. What are the conditions under which one learns to learn, and what educational ingredients encourage learning to learn in adults? How can the practice of continuous learning be developed effectively? How can children and youth be helped to develop attitudes, habits, and skills conducive to lifelong learning?

6. What factors are responsible for a positive anticipation of change? What characteristics of educational programs elicit positive learning responses from those with different change anticipation patterns?

7. What is the role of the educator in helping adults make the social, physical, and retraining adjustments arising as a consequence of changes in the labor force and the nature of work?

8. What factors, principles, and philosophy underlie the response of adult education to changes in the social and cultural setting?

9. What purposes have been sought and achieved; what goals and purposes are now being sought; and what should programs of adult education be trying to achieve?

10. What should be the relationship between the immediate and long-term goals of adult education agencies?

11. What administrative structures and organizations are most conducive to the development and maintenance of effective adult education programs?

12. What are the influences of different adult group participation patterns and independent study on the achievement of selected goals?

13. In what ways can the potential resources for continued learning be organized, integrated, and activated to meet society's need for intellectual growth?

14. In what ways do learning experiences of the volunteer teacher (leader) add to the learning outcomes of educational programs using volunteer teachers (leaders)? What personal and social factors influence the effectiveness of volunteer leaders?

15. What are the means by which communication can be effectively used to help reach adult program goals? What is the role of mass media?

16. What procedures of program planning lead to maximum adult learning? (Consider these in relation to concept attainment, understanding, skills, values, etc.)

17. What is the proper function of administration in adult education when it is part of the main goal of an educational agency and when it is a marginal activity and goal of the agency?

18. What are the role and function of guidance and counseling services for adults? What are the means and methods by which educational guidance and counseling can be provided to aid in the resolution of the continuing educational challenges of adulthood?

19. What aspects of the graduate curriculum in adult education are most useful for leadership in this emerging field?

20. What individual and/or agency objectives are reached in adult education programs? What approaches to and means of evaluation are useful in measuring outcomes of voluntary and/or forced participation in programs of continued learning?

Conclusion

The categories of research in this chapter are by no means exclusive. But they appear to be in the most need of solution at the present time. It is believed that the developing pace of research in adult education will have a greater potential for intercommunication among the applied fields, related disciplines, and the adult education enterprise if greater emphasis is placed on developing and testing models within each area of research need. Likewise, if results are tied to a common structure, the potentials for intercommunication are greater.

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This issue of the REVIEW was prepared by the
Committee on Higher Education

EARL V. PULLIAS, *Chairman*, University of Southern California, Los Angeles, California
STEPHEN ABRAHAMSON, University of Southern California, Los Angeles, California
ERNEST L. BOYER, State University of New York, Albany, New York
RUTH E. ECKERT, University of Minnesota, Minneapolis, Minnesota
WILLIAM B. MICHAEL, University of California, Santa Barbara, California

with the assistance of

C. RUSSELL DE BURLO, JR., Educational Testing Service, Princeton, New Jersey
JAMES I. DOI, University of Michigan, Ann Arbor, Michigan
DANIEL D. FEDER, San Francisco State College, San Francisco, California
RALPH R. FIELDS, Teachers College, Columbia University, New York, New York
JOHN W. MASTIN, U.S. Military Academy, West Point, New York
DANIEL C. NEALE, University of Minnesota, Minneapolis, Minnesota
JAMES P. WALSH, Monroe Community College, Rochester, New York
JAMES K. WINFREY, San Francisco State College, San Francisco, California
GEORGE D. YONGE, University of California, Davis, California

FOREWORD

There has been marked and steady growth in the literature on higher education in recent years. Individuals, colleges and universities, educational systems and organizations, foundations, and federal, state, and local political units are seeking answers to the varied and urgent problems of higher education in contemporary society. The search expresses itself in a flood of speaking and writing.

Higher learning is a vital part of a time of profound transition in almost every aspect of life. A web of pressures creates a very special situation for higher education at this time: (a) the apparently unlimited expectations of people, as expressed in a prolonged phenomenal increase in enrollment, (b) the lag in adequate facilities, (c) the growing shortage of college and university teachers, (d) the paucity of accurate knowledge and theory concerning the nature and function of higher learning, (e) the revolution in growth of knowledge, (f) the increasing demands on higher education, (g) the culture-wide upheaval in value systems, especially among the young, (h) a constant and growing financial crisis, and (i) threats to freedom from the extreme right and left. These and other factors produce a condition out of which thought, discussion, and writing must come; only death would not respond to such stimulation, and higher learning is not dead.

Such demands could produce significant research and great theoretical formulations. This issue of the REVIEW undertakes to summarize some of the best of that research and writing. In order to facilitate comparisons, the organization of this issue has followed in general that of the October 1960 issue, although two areas have been added: (a) government and education and (b) professional education.

The contributors were requested not to attempt to cover all of the literature of the five-year period since 1960, but rather to review critically those studies and theoretical writings that seemed most significant. Selection was a difficult task, requiring the examination of as many as 400 studies in some cases.

Significant research in education is extremely rare. The problems of research are bafflingly complex; the methods, lifted almost bodily from the physical sciences and often applied with a neurotic persistence, often bring disappointing results. To face this fact squarely is not to disparage attempts to apply the methods of physical science to the problems of education. Surely it is better to use existing methods, even with doubtful results, than to give up the search and remain in ignorance.

I have been convinced since my days as a graduate student that we need basically new approaches to research in education. Such approaches will probably arise out of bold, imaginative, and comprehensive theory. And the new approaches may be more like carefully conceived clinical observation than like the methods to which we are now wedded.

Thus, I would hope that in the next five years we will encourage especially the ablest students among us to formulate theories and seek imaginative ways of testing them. Mistakes will be made and research design may not fit the accepted pattern; but significant discoveries and meaningful insights may be achieved. This is not a plea for irresponsibility in method but for greater imagination and flexibility in both general theory and specific research design. In one way or another, this plea appears often in the chapters of this issue of the REVIEW.

I wish to express my keen appreciation to all who have helped with this issue for their skillful, prompt, and conscientious work. Each contributor worked diligently to make this issue scholarly and, at the same time, meaningful and interesting. It has been a personal and a professional joy to work with them.

Earl V. Pullias, *Chairman*
Committee on Higher Education

CHAPTER I

Students

GEORGE D. YONGE

This chapter is an attempt to highlight major research trends and findings on the student in higher education. Only selected studies published since June 1960 are reviewed.

Inasmuch as psychological facts are replies to specific questions posed by researchers, they are not independent of the specific methodologies used to answer these questions. For this reason, a clarification and understanding of methodology is essential to an understanding of the facts; some of the studies below are discussed with this in mind.

There is a necessary overlap between this chapter and the next, which deals with environments, since the psychological and educational implications of student characteristics cannot be adequately understood apart from an understanding of environmental characteristics.

Freshman Enrollment by Major Field

Parker has provided annual statistical summaries by which differential enrollment trends among major fields can be estimated. According to his surveys (Parker, 1962, 1965), full-time freshman enrollment increased by approximately 42 percent from 1960-61 to 1964-65. Nursing showed the greatest increase in enrollment (62 percent), whereas the increased enrollment in engineering (13 percent) and in agriculture (24 percent) did not keep pace with the overall rate of increase. Freshmen declaring majors in arts and sciences, business, and education showed increases in line with the overall trend. In both 1960-61 and 1964-65, approximately 58 percent of the enrolling freshmen were male. Further, the proportion of males in each of the above major field categories was the same in 1960-61 as it was in 1964-65.

The figures derived from Parker's surveys are only approximate projections of overall enrollment trends by college major. In 1960-61, the freshman enrollments were based on data furnished by 858 institutions; in 1964-65, 935 institutions provided enrollment data. Furthermore, the declaration of a major is a tentative commitment for most freshmen. Since different major fields have different holding powers (Thistlethwaite, 1960), these data should not be used to estimate other than *freshman* enrollments in various majors.

Two studies suggest that increasing enrollments do not necessarily result in a reduction in ability level. Darley (1962) obtained ability scores for freshmen entering 167 institutions in 1952 and in 1959. He found that the mean ability score for 1952 freshmen was lower than the mean score for 1959 freshmen, even though these institutions reported a marked increase in enrollment during this period. Hood and Berdie (1964) noted that, during the past 11 years in Minnesota, the proportion of higher ability students planning to attend college increased almost three times as fast as the total increase in high school graduates planning to attend college. The net result has been an increase in the intellectual level of college students over the past decade. To the extent that Minnesota data can be generalized to other states, there is no reason to assume that the average ability of college students is decreasing because of increasing enrollments.

Selection, Prediction, and Persistence

Selection

Heist and Webster (1960) wrote a provocative paper arguing for a consideration of nonintellective variables as supplements to the usual selection procedures. They presented data to illustrate that attitudes, values, and interests of students should not be overlooked in the educational process. Institutions with similar aims and with student bodies of comparable ability but with different value orientations cannot realize their aims in the same way. The intellectual climates provided by student attitudes and values must be understood and taken into account before institutional objectives can be realized.

In addition to some of the usual ability, socioeconomic, and motivational correlates of college persistence, Thistlethwaite (1963) reported that faculty encouragement of enthusiasm, humanism, affiliation, independence, and achievement was positively related to persistence and that faculty encouragement of compliance and vocationalism was negatively related to persistence. In students, estheticism, reflectiveness, intellectualism, and competition were positively related to retention. On the basis of his results, Thistlethwaite drew some implications regarding the use of other than intellective variables for the selection policies of institutions. In comparing dropouts and persisters irrespective of the institution attended, Thistlethwaite implied that college withdrawal is the same psychological phenomenon no matter where it occurs. Although interinstitutional comparisons may suggest relevant correlates of persistence, both selection and persistence are primarily intrainstitutional problems, and they will eventually have to be understood at that level.

McConnell (1961) provided a concise overview of the results of many of the recent studies dealing with student and institutional characteristics. He noted that institutions are differentially selective with respect to such student characteristics as aptitude, interests, values, social background, and intellectual disposition. Differences in college environments were also pointed out. Further, he considered the question of fitting the student to the college so that optimum student development might be realized.

Prediction

Seibel (1963), using a nationally representative sample of approximately 10,000 graduates from 147 high schools, studied the correlations among *Preliminary Scholastic Aptitude Test (PSAT)* scores, high school rank, and college attendance. He obtained the following point-biserial correlations between college attendance and the three independent variables: *PSAT* verbal, 0.53; *PSAT* mathematical, 0.51; and rank-in-class, 0.40. From his data, Seibel also organized a table reflecting the probability of college attendance for various levels on the *PSAT* and rank-in-class dimensions. High scores on these variables appeared to be more closely related to college attendance for men than for women. Seibel also presented *PSAT* norms for students attending various types of institutions. As in Darley's study (1962), based on college freshman scores, there was a progressive increase in mean ability scores of students attending institutions according to the highest degree offered. There was, however, considerable overlap among the distributions of ability scores classified by the various types of institutions.

It would be extremely difficult to demonstrate any direct effect of the writings of Fishman (1962) on the types of prediction studies currently in vogue. Nevertheless, many investigators have been moving away from the old model of predicting intellective criteria (e.g., grades) from intellective predictors (e.g., ability tests). This trend, as slight as it may be, can be attributed in part to the greater diversity among psychological tests, which has increased the possibility of using different types of prediction and criterion variables.

Although grades are still a popular criterion, many investigators have displayed an interest in nonintellective predictors or correlates of grades. For example, Goodstein and Heilbrun (1962) studied the contribution of scores on the *Edwards Personal Preference Schedule* to achievement at three levels of ability. They found that personality factors contribute most to the prediction of the academic achievement of the average college male. Heist and Williams (1961) reported significant differences among three achievement levels in terms of a system used to classify *Strong Vocational Interest Blank* profiles for degree of intellectual disposition. On the basis of this scheme, the high achievers were described as being more strongly oriented toward inquiry and speculative and creative thought than the other two achievement groups. However, within this homogeneous sample of bright science majors, most other differences were slight.

The study reported by Brown (1962), dealing with faculty nominations of ideal students, represented an attempt to study student characteristics related to certain nonintellective criteria valued by faculty members. Although the problems inherent in the use of nominations are great, this study reflects a refreshing attempt to deviate from the usually prosaic study of grade point average correlates.

Holland and Nichols (1964) focused on the prediction of intellective and nonintellective criteria by means of intellective and nonintellective predictors. Their criteria of nonintellective achievements were as predictable as was their intellective criterion (self-reported freshman grade point average). It was generally found that the best predictors of self-report achievements were self-report estimates of potential achievement. The question of predictor-criterion contamination needs to be raised here since both measures are, in many instances, based on self-report data.

Nasatir (1963) published a study concerned with prediction of the rate of academic failure in male dormitories. The independent variables were three dichotomies: individual orientation (academic versus nonacademic), context (academic versus nonacademic dormitories, defined by the proportion of dormitory members with an academic orientation), and individual integration (integrated versus nonintegrated, defined by amount of time spent with other members of the dormitory). Nasatir's study is one of a growing number which focus on the interaction of student and environmental characteristics. Furthermore, the ideas embodied in his paper are relevant to the theoretical framework provided by Newcomb (1962), in which consensual expectations and support derived from group membership were treated. It is, therefore, unfortunate that Nasatir's results were vitiated by tabular inconsistencies and errors. Nevertheless, the paper deserves careful reading; the ideas presented and the approach used appear to provide fruitful leads for studies which may be done in the future dealing with the prediction of academic failure.

Persistence

Perhaps the most ambitious study of the relationship between ability and college outcome is the study by Darley (1962). The major limitation of this investigation is that the ability data are based on 1952-53 entering students and the outcome data are based on the 1956 academic status of these students. However, Darley pointed up some very provocative findings regarding the distribution of ability by type of institution in four states (Minnesota, Ohio, Texas, and Wisconsin) and the relationship of ability to college outcome in these institutions. He reported that within some types of institutions the sex of the student was related to outcome; apparently it is easier for women to remain in some institutions, and men in others. However, these differences were not systematically investigated by control for such variables as major field and ability level. A comparison of high ability students (top 25 percent) indicated that types of institutions had different holding power with respect to these students. For example, in Minnesota only 47 percent of the high ability men enrolled in state colleges graduated, whereas 73 percent of the men enrolled in private coeducational colleges had graduated by 1956.

Another aspect of Darley's study dealt with distribution of ability among a nationally representative sample of 200 institutions. These data were based on the scores of 1952 entering freshmen. In view of the diversity of the mean ability scores at these 200 institutions, Darley concluded that every student in the country can find an accredited college that will admit him, regardless of his ability level. In addition, Darley noted that diversity in ability level among institutions was the pattern no matter how they were classified (e.g., liberal arts colleges). The mythology of higher education by which certain types of institutions are regarded, without qualification, as superior in the ability level of their students to other types was not univocally supported by his data.

Thistlethwaite's (1963) study, dealing with the relationships between persistence and personality and environmental factors, has already been mentioned. Matson (1963) and Willingham (1962) reported that fraternity members did not drop out of college as frequently as did nonfraternity members.

Astin (1964b), using a sample of 6,600 high aptitude students, studied the relationship between certain environmental and student characteristics and dropping out of college over a four-year period. After controlling for differences in student input variables, the following *California Psychological Inventory* measures were found to be consistently related to dropping out for both sexes: self-control (negative), flexibility (positive), and achievement via conformance (negative). None of the college variables (e.g., private versus public control) were related to the dropout criterion for men. For women, the masculinity of the college (e.g., percent of males enrolled) was related positively to dropping out, as was the private (versus public) classification of the college. Affluence and being a women's college were negatively related to the dropout criterion. Astin also found that the dropouts, compared to persisters, came from a lower socioeconomic background, had lower ranks in high school, and were lower on several questionnaire items that assessed degree of academic motivation. The comparison of dropouts and persisters irrespective of the institutions from which they withdrew is a specific limitation of Astin's study. Darley's (1962) data, for example. indicate that institutions differ markedly in their power to hold high ability students; this at least suggests that college withdrawal may reflect different psychological phenomena at various institutions.

Interaction of Student and Environmental Characteristics

The development of the *College Characteristics Index (CCI)* to measure environmental press and of the corresponding *Activities Index (AI)* to measure psychological needs (Stern, 1962b) has stimulated research and thought concerning the interaction of student and environmental characteristics. In considering some of these studies, it may be well to focus on certain methodological difficulties connected with the use of the *CCI* and *AI* as well as with certain extensions of the ideas of Stern and Pace proposed by Astin and Holland (1961).

For example, it is difficult to defend the experimental independence of the *CCI* and *AI* because both sets of measures are usually derived from the same individuals. Thus, to the extent that student characteristics modify what is perceived in an environment and the extent to which the environment modifies student characteristics, the interaction is already expressed in the *CCI* and *AI* measures; hence, artificial results may be obtained when *CCI* results are, in turn, compared with *AI* results. The research worker interested in studying the interaction between student and environmental characteristics should, of course, have independent measures of these two types of characteristics.

By way of demonstrating that the *CCI* and *AI* provide independent measures, McFee (1961), using a sample of psychology students at one institution, showed that there was no correlation between *CCI* scores and the parallel scores on the *AI*. However, McFee ignored the question of possible correlations among nonparallel scores derived from these two tests.

Stern (1962b) reported a *CCI-AI* matrix of intercorrelations derived by correlating the *CCI* and *AI* mean scores of 43 colleges. Commenting on these data in conjunction with the study by McFee (1961), he stated that *CCI* ratings are not influenced by personal needs but that there is a correspondence between the pattern of needs of student bodies and the prevailing press of institutions. However, since McFee's results are not compelling, to the extent that students with varying needs perceive their environments differently, Stern's data are ambiguous. Further, it is difficult to compare correlations based on a sampling unit of individuals (McFee) with correlations based on a sampling unit of institutions (Stern). Since mean scores are generally more reliable than individual scores, correlations derived from the former will be generally higher than correlations based on the latter. Pace (1962), commenting on Stern's data, interpreted the magnitude of the *CCI-AI* correlations as indicating that only about 30 percent of the distinctive environment of an institution is accounted for by student characteristics. Of course, one could also say that about 30 percent of the distinctive student characteristics are accounted for by institutional environments. In either case, 30 percent is a gratuitous figure in the absence of reliability data. More studies of the relationships among need-press scores, primarily *within* a variety of institutions, are needed before the interpretations of Pace and Stern can be accepted with a high degree of confidence. In the light of the published data, it is difficult to maintain a sharp distinction between student and environmental characteristics as measured by the *AI* and *CCI*.

The Environmental Assessment Technique (EAT), first put forth by Astin and Holland (1961) and later used in a series of articles by Astin (1962; 1963a, b; 1964a, c) relating institutional, student, and EAT dimensions, illustrates a concerted effort to obtain independent measures of student and environmental characteristics. The EAT measures eight characteristics of college environments: size, average intelligence, and six personal orientations (based on the proportions of students graduated from a given institution in major fields) classified as realistic, intellectual, social, conventional, enterprising, and artistic. In a subsequent study, Astin (1962) factor-analyzed 33 college attributes and reported six principal dimensions: affluence, size, private versus public, masculinity, realistic emphasis, and homogeneity of the environment. In another study, Astin (1964c) factor-analyzed 52 student input variables and obtained six major dimensions: intellectualism, estheticism, status, leadership, pragmatism, and masculinity. In the most recent study of the series, Astin (1964a) compared the presumably independent estimates of student and institutional characteristics derived from the above studies. He reported that characteristics of entering freshmen classes were highly related to institutional characteristics. That is, the high ability students were exercising a high degree of self-selection in deciding where to attend college.

In terms of the methodology proposed by Astin, certain institutional or environmental attributes are based on the characteristics of past student bodies (e.g., percent graduated in realistic fields), whereas student characteristics are defined in terms of the characteristics of present student bodies (e.g., percent enrolled in realistic fields). However, it is difficult to see the magic by which student characteristics are transformed because of time into environmental characteristics. And if this temporal distinction is valid, some of the environmental characteristics in Astin's studies will have to be considered student characteristics with reference to still previous generations of students. Rather than providing independent estimates of student and environmental characteristics, Astin's methodology may merely be a way of estimating the extent to which the processes of formal selection, self-selection, or both remain relatively constant from one generation of students to another.

These methodological questions render some of the interpretations of the above-mentioned studies ambiguous. Nonetheless, Astin, Pace, and Stern have provided an inestimable contribution to the literature dealing with the student in higher education. Their pioneering studies are truly breakthroughs; they have shifted the research emphasis from a descriptive to a dynamic model.

Self-Selection

The phenomenon of self-selection of institutions by students, noted above, is corroborated by other studies taking a slightly different approach. McConnell and Heist (1962) explicitly recognized this phenomenon in their chapter, as did Stern (1962a) implicitly in his chapter, in *The American College* (Sanford, 1962). Heist and others (1961) found that students (future Ph.D.'s) attending institutions of high and low scholastic productivity differed considerably on several personality measures after being equated for scholastic aptitude. The general conclusion was that those students of high ability entering the institutions of high productivity were more scholarly and flexible and less authoritarian than those students of equally high ability entering institutions of low productivity. Farwell, Warren, and McConnell (1962) also reported personality differences among high ability students attending different types of institutions. They reported that students entering Ivy League universities were more strongly attracted to intellectual pursuits and more independent, original, and flexible than students attending public universities. Further, men who entered Roman Catholic institutions were generally less intellectually oriented and more authoritarian than men who entered Protestant institutions. These were National Merit Scholars, who could have attended virtually any institution of their choice.

McConnell (1961) gave a very brief but instructive illustration of how faculty images of desirable students (formal selection) provide the student with an image of the institution, allowing student self-selection to operate over and beyond formal selection. The approximate result of this process is that a certain type of student and a certain type of faculty select each other.

Clark (1960, 1962), by developing the theme of institutional images and their implications for student self-selection, shed considerable light on this important phenomenon. He considered how images might be shaped, maintained, and changed, and he suggested some areas of needed research on institutional images.

Within a given institution, self-selection was found to occur regarding participation and membership in student subcultures (McConnell, 1962) and even within a major field, regarding the decision to participate in special programs such as honors (Warren, 1963). Both within and across institutions, there is marked self-selection of major field (Bereiter and Freedman, 1962; Farwell, Warren, and McConnell, 1962).

The general phenomenon of self-selection is one way in which the interaction between student and environmental characteristics is manifested. The attitudes, values, and interests of students are to be found as much in the environment as in the individual. That is, the figure-ground aspects of the environment (its meanings) are modified by student characteristics such that certain possible choices (meanings) are more obvious than others.

Summary and Conclusions

It was noted that the average ability level of college students is not necessarily decreasing even though enrollment continues to increase. In the area of selection, there is a growing concern for the inclusion of environmental and nonintellective variables in the selection process. Nonintellective predictors have been used to predict both intellective and nonintellective criteria to a greater degree than was previously true. Perhaps the most salient and important research trend to emerge was the systematic investigation of the interaction between student and environmental characteristics. These studies focused on the correlations among measured student and environmental characteristics as well as the study of student-college self-selection. Perhaps this shift from a predominantly descriptive to a more dynamic level of analysis may be considered a major breakthrough in the sociopsychological study of the student in higher education.

Two areas of research conspicuous by their absence were studies of student satisfaction with regard to educational experiences and the study of faculty attitudes, values, and interests and their relationships to student characteristics. To the extent that faculties do influence student development and aspirations, this neglected area of research is essential to an adequate understanding of student-environment interactions.

Studies are needed to help clarify certain methodological difficulties mentioned in the present chapter, and many of the studies reviewed warrant replication at other institutions and with students less gifted in terms of measured scholastic aptitude.

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CHAPTER II

Campus Environment

WILLIAM B. MICHAEL and ERNEST L. BOYER

Since Pace and McFee prepared their chapter for the October 1960 issue of the REVIEW, the direction of research on the college environment has been toward the refinement and consolidation of past efforts. Although both individual workers, with substantial grants-in-aid, and agencies such as the Center for the Study of Higher Education, the Bureau of Applied Social Research of Columbia University, and the National Merit Scholarship Corporation have been conducting research in a systematic and careful fashion, little innovation has resulted. Nevertheless, there have been numerous large-scale research investigations that constitute a validation and verification of the constructs and theory developed by imaginative contributors in the late 1950's.

Summaries and Bibliographies

Since 1960 there have been several important summaries and bibliographic contributions concerned with research on the college environment and related topics. Three sources are particularly noteworthy: (a) Barton's (1961) *Organizational Measurement and Its Bearing on the Study of College Environments;* (b) Sanford's (1962) monumental volume, *The American College,* in which the chapters by Brown (1962), McConnell and Heist (1962), and Stern (1962a) are especially pertinent; and (c) Stern's (1963) definitive article, "Characteristics of the Intellectual Climate in College Environments" in the *Harvard Educational Review,* which updated two former contributions (Stern, 1962a, b).

Since, in the reviewers' estimation, the article by Stern represented the most significant contribution regarding college environments to be published during the past five years, it will be given extensive consideration in this chapter.

Intellectual Climates

Expanding considerably upon his earlier and somewhat popularized paper (Pace, 1961) concerned with diversity of college environments, Pace (1962) described the items and scales of the *College Characteristics Index (CCI)*, identified four factor dimensions of the instrument, pointed out similarities and differences in the profiles of certain colleges on these dimensions, and enumerated several methodological approaches to the study of college environments. He also related how, in terms of their response to items of the *CCI*, students at San Francisco State College held a perception of the intellectual climate at their campus that was quite different from that formulated by Riesman and Jencks (1962a) in their subjective and impressionistic anthropological commentary on the culture of this college.

From the data furnished in a large-scale survey of 33,982 seniors at 135 American colleges and universities, Davis (1963) undertook the study of one variable, *intellectualism*, in terms of the percentages of students who responded to certain questions about the purposes of a college or university. When a student at a given campus answered a question relative to whether it was important to him personally, his response was interpreted as a measure of the *true value climate* of intellectualism at that campus. When each student responded to the same question as being most important to the typical student at the campus, his response was taken as a measure of the *perceived climate* of intellectualism. An index of quality for a given college was based on the average level of ability scores of the freshmen enrolled at that college.

Briefly, the data analyzed by Davis revealed the following five findings: (a) A large proportion of students at private, small institutions of high quality endorsed intellectual values, whereas only a small proportion of students at lower quality institutions (principally large public institutions and technological schools) supported intellectual values. (b) The climate of perceived values was positively related to the climate of true values. (c) The perceptions that students held regarding an institutional climate were distorted toward their own values. (d) Students who maintained relatively high grade point averages in comparison with those with relatively low grade point averages tended to furnish lower estimates of the intellectuality of their campuses. (e) Relatively marked discrepancies between the degree of perceived intellectuality and true intellectuality were associated with the geographic location of the college. These findings were meaningfully interpreted within a theoretical framework of social perception involving the constructs of contrast and assimilation.

As previously mentioned, the most definitive paper concerning college environments to appear since late 1960 was that by Stern (1963), who presented not only a brief history of prior research and definitions of key terms but also a description and discussion of both the dimensions of several college environments and the personality characteristics of a sample of more than one thousand students. Classifying environmental, or external, pressures as "press" and the psychological counterparts within the individual as "needs," Stern emphasized that press is inferred from actions done to the individual in some specific setting and that needs are inferred from the characteristic behavior manifested by the individual in his striving to structure and to interpret the environment. Stern also described briefly two instruments that had been developed, respectively, for the measurement of needs and press: (a) the *Activities Index (AI)* consisting of 30 scales of 10 items each to which the respondent indicates his like or dislike of each item and (b) the previously cited *CCI*, which is similarly designed. The *AI* questionnaire contains items describing commonplace daily activities which individuals encounter in college, such as liking or disliking a definite schedule for studying. The items in the *CCI* scale are concerned with policies, procedures, impressions, attitudes, and activities that may be characteristic of various types of undergraduate college settings.

A much abbreviated summary of the conclusions that Stern drew from a vast amount of previous research with the *AI* and the *CCI* appears to be in order, particularly for the reader who is unfamiliar with such work. A few of the major conclusions follow:

1. Significant relationships have been found between needs scale profiles of the *AI* and other forms of overt behavior, such as academic performance, study habits, reading skills, attitudes and values, deviant behavior, other personality processes, career choice, and social background.

2. Professional workers in a field have exhibited higher standing on scales reflecting emotional controls and intellectual needs than have students preparing for work in the same fields, with the exception of teachers who when matched with education majors have shown lower intellectual needs.

3. Student bodies have been described by needs scale profiles that have been clearly seen to represent the personalized versions of the existing presses at their institution, although there has been greater variability between students as they described themselves on the *AI* than there has been in the *CCI* descriptions of their institutional press. (However, this discrepancy is not due to the fact that both sets of data are derived from the same students; for, as McFee (1961) has shown, there is a negligible correlation between the needs preferences that students report for themselves and the press characteristics that they ascribe to their college environment, whether the responses are to relatively impressionistic or subjective items or to factual or readily verifiable items.)

4. Significant relationships have been determined between profiles on press scales and types of institutions sampled. Specifically, three rather distinct types of colleges have emerged: (a) the denominational colleges, with marked emphasis on conformity, constraint, and dependence (the majority of colleges studied have tended to be relatively high in these characteristics); (b) the small private liberal arts colleges shown to have highest standing on the intellectual press as well as a high emphasis on personal autonomy; (c) the colleges described by their students as sources of social pleasure and togetherness, although these colleges have typically lacked academic strength and scholastic purpose.

In basing his most recent findings concerning the dimensions of the college environment on the responses of 1,076 students at 23 institutions of higher learning, who in terms of their availability had been matched for *AI* and *CCI* responses, Stern identified six environmental factors extracted from the intercorrelations of the *CCI* scales as intellectual orientation, social effectiveness, play, friendliness, constraint, and dominance-submission. He then proceeded to report systematically how the perceptions of students who were attending two groups of colleges at opposite (high and low) positions on an intellectual climate score differed with respect to each of the environmental scales on the *CCI* as well as to each of the personality scales of the *AI*. Numerous comparisons were made between 11 high-ranking and 11 low-ranking institutions in intellectual climate relative to (a) size and composition of student bodies, (b) regional representation, (c) type of institutional control, such as public, private, or denominational, (d) type of program, such as liberal arts, teacher preparatory, or professional, (e) highest degree offered, (f) student activities, (g) financial assets, and (h) tuition. Personality characteristics of students in the colleges of high and low intellectual climate were also compared and evaluated.

In the main, the conclusions reported in his summary of previous investigations with the *AI* and *CCI* were sustained. Certain specific findings may be noted. Derived from an unweighted sum of scores on 14 *CCI* scales that were grouped in four components identified as substantive intellectual interests, academic motivation, social effectiveness, and self-assurance, this intellectual climate score exhibited correlations of 0.49 with the percentage of National Merit Scholarship finalists among entering students, 0.59 with the number on such scholars at all class levels, and 0.83 with a verbal subtest score of the *College Entrance Examination Board Scholastic Aptitude Test.* Stern interpreted these correlational findings to indicate that colleges choose their students more carefully than the students select their colleges. Most of the colleges high in intellectual climate—the so-called institutions of academic excellence—were found to be relatively small, residential, and expensive private liberal arts colleges in which (a) a strong general education program was in existence; (b) stress was placed on scholarly activities and hard work; (c) personal autonomy, nonconformity, and intellectual freedom for both students and faculty were highly valued and respected; (d) professors were available to talk with students informally and to encourage them; and (e) cultural activities and intellectually-oriented events were numerous and well attended. On the other hand, colleges that stood low in intellectual climate were largely public institutions in which (a) the orientation was toward practical and vocational curricula rather than toward intellectual or cultural activities as ends in themselves, although the prevailing attitude was not necessarily anti-intellectual; (b) propriety in social relationships and in patterns of conduct was closely observed; (c) opportunities for extracurricular activities were numerous; (d) considerable organizational, bureaucratic emphasis on such matters as class attendance and departmentalization of the curricula existed; and (e) the separation between the peer culture and the academic community was relatively well defined. From the standpoint of personality, students in colleges with high intellectual climate in comparison with those in institutions with low intellectual climate tended to (a) possess stronger intellectual interests; (b) have a greater desire to understand themselves as well as others; (c) understand political and social problems and be able to find solutions; (d) exhibit somewhat lower dependence needs; (e) show less self-indulgence; and (f) demonstrate more spontaneity in emotional expression.

Stern implied that future use of his instruments and procedures would permit (a) determination of answers to specific questions of concern to college faculties, (b) a means for the comparison of the expectations not only of various student and faculty groups within a college but also of high school students, teachers, counselors, and parents, and (c) a basis for the formulation of norms that appropriately describe different kinds of colleges and types of educational programs. In any event, this paper is worth detailed study and serious consideration in relation to the problems of selection and placement of students in college, the realization of excellence in the teaching and learning process, and the design and execution of necessary evaluation studies.

College and Student Characteristics

Among several papers prepared by workers at the National Merit Scholarship Corporation, four articles concerned with the characteristics of students and colleges were especially pertinent. In a factor analysis of 33 major qualities of colleges for a sample of 335 institutions, Astin (1962a) defined six principal dimensions along which institutions vary: affluence (wealth), size, private versus public control, masculinity versus femininity, homogeneity of environment, and realistic (technical) emphasis. Reflecting financial wealth, quality of students and faculty, and environmental characteristics such as an intellectual and enterprising orientation and a lack of technical and vocational emphasis, the factor of affluence accounted for the largest proportion of variance. In an empirical study of 30 well endowed and 30 poorly endowed private institutions and of 30 high-budget and 30 low-budget public institutions, Astin and Holland (1962) found that the ratios of National Merit Scholars attending the private and public institutions classified as high in comparison with those classified as low were, respectively, 43 to 1 and 16 to 1. In addition, the quality of students and faculty was considerably higher at the wealthier institutions than at the ones with low endowment or with low budget allocations.

In a factor-analytic study of 52 input variables for which he had responses from more than 127,000 freshmen at 248 colleges, Astin (1964c) found six factors which he identified as intellectualism, estheticism, status, leadership, masculinity, and pragmatism. In a second report, Astin (1964a) noted that the aspirations of entering freshmen were harmonious with the characteristics of the institutions they selected. Moreover, in multiple-regression analysis each input factor with the exception of leadership could be predicted with a high degree of accuracy from the known characteristics of the institution (the median cross-validated multiple correlation being 0.85).

Additional References: Pace (1962); Sutherland and others (1962).

New Scales and Assessment Procedures

In their description of a method for measurement of college environments which they called the Environmental Assessment Technique (EAT), Astin and Holland (1961) proposed eight characteristics of the student body—size, average intelligence, and six personal orientations identified as realistic, intellectual, social, conventional, enterprising, and artistic—and correlated these characteristics with the *CCI* scales. Having shown the stability of the six personal variables to be relatively high, the writers discussed the practical advantages of the simplicity of the EAT and pointed to its uses in the study of student-faculty interactions, in the formation of comparisons of the characteristics of different institutions, and in the conduct of cross-cultural investigations. Subsequently, Astin (1963b) furnished additional validation data for seniors at 76 colleges and universities.

In a new, carefully standardized 150-item instrument known as the *College and University Environment Scales (CUES)*, Pace (1963), who had demonstrated a lack of parallelism in the organization of factors in the *AI* with those in the *CCI*, provided for measures on five factors of the college and university environment which he identified as practicality, community, awareness, propriety, and scholarship. Relative to the 30 scales of the *AI*, each of which consists of only 10 items, the five 30-item scales of the *CUES* afford at least three important advantages: (a) a more parsimonious evaluation of the institutional differences in educational environments, (b) greater score reliability, and (c) scores that could be related to somewhat more representative normative data.

Two expository papers, concerned with the measurement of student characteristics and with the assessment of the quality of institutions of higher learning respectively, were those of McConnell (1963) and Stuit (1962), each of whom cited several relevant research studies.

Student and Faculty Subcultures

Anthropological Studies

During the past five years, several contributions have appeared that represent an anthropological approach to the study of college cultures—especially student and faculty subcultures. Concerned with the patterns of values, beliefs, and prescribed modes of behavior of various student and faculty groups at different colleges, these anthropological studies represent highly subjective, impressionistic, and literary essays, or social commentaries, that would not meet the scientific criteria of objectivity, control, and replicability ordinarily required in educational and psychological research. Nevertheless, these investigations, involving largely informal observations, may be viewed as rich sources of hypotheses and insights. Since most of these studies are highly speculative, they will be treated briefly.

Subsequent to considering the American college in terms of the interests of occupational, religious, geographic, political, social, ethnic, and other groups, Riesman and Jencks (1962b) presented case studies from three colleges: University of Massachusetts, Boston College, and San Francisco State College. In addition to describing similarities and differences in the student and faculty cultures, the writers also considered briefly the marked variations in the campus environments of Michigan State University at Oakland and Montieth College in Michigan. Riesman and Jencks (1962a) also presented a separate vignette of San Francisco State College, to which Pace (1962) registered certain objections (as stated on page 265). Jencks and Riesman (1962) also furnished a case study about the patterns of residential education at Harvard University. Two other descriptive studies pertaining to student cultures were those of Bushnell (1962) concerning Vassar College and of Hughes, Becker, and Geer (1962) regarding a medical school.

Resting upon a limited amount of empirical evidence was an investigation by Gusfield and Riesman (1964), who noted differences in the relative frequency of professors' belonging to three somewhat ill-defined career types in each of two new colleges with markedly different educational objectives and programs. Although the findings of the study suggested that the career orientations of professors in a college devoted to a strong program of general education differed from those of professors in a college with relatively traditional departmental specializations, the failure of the writers to delineate clearly the similarities and differences in the curricula as well as in the student bodies of the two institutions not only seriously curtailed the reader's understanding of the material presented but also substantially limited formulation of conclusions.

Empirical and Theoretical Contributions

From interviews, observations, and self-reports of graduating seniors at a large state university, Gottlieb and Hodgkins (1963) not only furnished some positive evidence to confirm the existence of Trow's (1960) four student subcultures (academic, collegiate, vocational, and deviant) but also described differences in the level of scholastic achievement of students classified as falling in the subcultures. They also formulated a comprehensive sociopsychological theory to explain how the subcultures for groups of college students develop relative to changes in value orientations and attitudes. Their rationale was basically consistent with Newcomb's (1962) extensive theoretical arguments regarding peer group formation. In postulating that the individual has a need for self-consistency, Gottlieb and Hodgkins suggested that subcultures develop when students (a) minimize the importance of dissonant goals espoused by the college and (b) seek support of their families and college peers with comparable value systems as a means of reinforcing their existing value orientations. If one posits a hierarchy of goals for students which, though similar in substance to those of the college community, are different in order of affective value, it is possible for the principal characteristics of each of several subgroups of students to be described in terms of their order of preference for certain goals. After presenting their rationale, Gottlieb and Hodgkins defined a subculture as "a segment of the student body at a given institution holding a value orientation distinctive of that of the college community and/or other segments of the student body."

Student Perceptions of Faculty and Fellow Students

Three empirical investigations revealed informative data concerning the perceptions that students hold of a faculty. In his study of highly talented students, Thistlethwaite (1960) requested them to evaluate on a checklist the three college professors who they thought had contributed most to their desire to learn. He noted that the students overwhelmingly elected instructors who had shown great enthusiasm for their disciplines. At least 80 percent of the participants pointed out that these teachers had exhibited an interest in them as well as in their work.

For a sample of college students who were judged to come from lower, middle, and upper social classes, Gottlieb (1962) found that virtually all students chose as their ideal teacher one who would be entertaining in his presentation, who would know his field well, and who would make students produce. Students from a low social class who were also relatively low achievers preferred instructors who would help them in an impersonal way with their career plans, whereas students from a low social class who were relatively high achievers appeared to depend on adults and teachers for considerable emotional support. There was a marked tendency for high achievers in all social groups to stress originality, creativity, and dedication to their scholastic endeavors. Since at all achievement levels male respondents from the middle and upper social classes, in contrast to those from the lower social class, indicated that their parents served as sources of influence and encouragement, it would appear that college males from the lower social class may be relatively dependent upon a college instructor or adult authority figure for encouragement and reinforcement if they are to do superior work in college.

Employing 180 items from the *CCI* divided into two groups of 90 items each—one group pertaining to college students' perceptions of fellow students and the other to students' perceptions of faculty members—Nunnally, Thistlethwaite, and Wolfe (1963) carried out two separate factor analyses of these two sets of items, which had been administered to 500 freshman and sophomore students at the University of Illinois. Relative to students' perceptions of the characteristics of faculty, the six dimensions isolated were described as systematized energy, toughness, availability to students, interest of lectures, interest in arts and humanities, and vocational emphasis. With respect to the perceptions of the characteristics of fellow students, six factors were identified to be intellectual drive, personal appearance and manners, competition, science interest, pressure against scholarly activities, and interest in visiting speakers.

Additional References: Richardson and Blocker (1963); Rubin (1963); Taylor (1962); Teahan (1963); Veldman, Peck, and McGuire (1961).

Relation of College Environment to Productivity

Although the principal emphasis in Chapter III is directed toward problems associated with outcomes of higher education, with changes in the behavior of college students, and with their productivity, it is advantageous to describe briefly some of the significant contributions that are concerned especially with the relation of college climates to productivity and to the achievement of college and university students. In harmony with the hypothesis set forth by McConnell and Heist (1962) that "the efficacy of a college is the product of the fortunate conjunction of student characteristics and expectations, *and* the demands, sanctions, and opportunities of the college environment and its subcultures" (p. 250), Brown (1962) reproduced a model originally developed by research workers at the National Merit Scholarship Corporation; the model related to desired outcomes in the college experience such factors as (a) college presses from peer groups and faculty groups, (b) antecedent sociopsychological variables associated with family and high school experiences, (c) personal dispositions (abilities, motives, values, personality traits, and career and educational plans), and (d) societal interventions, such as scholarships and awards. Consistent with the position taken by McConnell and Heist in their many research studies as well as with the orientation of several other investigators, Brown concluded that different types of students will perform at their optimal level in different kinds of college environments. Relative to problems of selection and prediction, Brown argued within a sociopsychological theory, as have Fishman (1962), Pace (1961, 1962), and Stern (1962a, 1963), that efforts should be directed toward promoting achievement either by matching the individual to the college environment that will maximize the realization of his potential or by arranging the college environment to meet the different patterns of needs and expectations of different groups of students.

For example, Thistlethwaite (1963) presented evidence that the climate of undergraduate colleges that is associated with the subsequent production of future scientists differs substantially from that of undergraduate colleges noted for their preparation of scholars in the social sciences and humanities. Among several other publications that furnished informative empirical results concerning the relationship of college environments to productivity were those of Astin (1961; 1962b, c; 1963a, c; 1964b), Astin and Holland (1962), Nichols (1964), and Thistlethwaite (1960; 1962a, b). Several of these papers offered somewhat contradictory findings concerning the productivity of Ph.D.'s as a function of college environment in view of the use of both different criteria of output and various kinds of statistical adjustments to correct for differences among colleges relative to (a) ability level of students, (b) major fields, and (c) such characteristics as intent and aspiration. Detailed consideration of the substantive contributions of these research studies concerned with productivity may be found in Chapter III.

Conclusion

It is evident from the several contributions just reviewed that many well designed and relatively sophisticated studies based on substantial empirical findings have given support to various theoretical positions regarding (a) the sociopsychological nature of college environments, (b) student characteristics, (c) faculty and student subcultures, and (d) student perceptions of faculty and of other students. In light of expanding college enrollments and probable changes in the value systems of students, of faculty, and of college and university administrators during the years ahead, a center or bureau of institutional research might advantageously undertake periodic studies to assess these changes, especially if continued improvements are to be realized in the selection and placement of college students and in the evaluation of modifications of student behavior and attitudes relative to dynamic institutional objectives. In particular, additional carefully planned investigations involving use of control groups are needed to ascertain whether changes noted in attitudes of students occur in relation to differences in college environment or, in fact, take place in spite of any formal college experience.

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CHAPTER III

Outcomes of College

ERNEST L. BOYER and WILLIAM B. MICHAEL*

Why do students drop out of college? What happens to those who remain? To what extent do college outcomes persist in later life? These questions were all productively researched during the period covered by this issue of the REVIEW. Although most of the recent research has duplicated and confirmed earlier investigations, exceptions can be noted. Of special consequence during this period have been investigations which were designed to study noncollege young adults at the same time that changes among college students were being assessed. In light of data from these and other studies, a modification of earlier conclusions is indicated, and new areas of investigation are introduced.

Early Withdrawal from College

Since the October 1960 issue of the REVIEW, the much-examined college dropout problem has been further probed. A survey covering four decades of research was completed; an investigation of attrition among graduate students was reported; and, most significantly, a cluster of studies based upon a new and realistic definition of the college dropout has appeared.

Rate of Attrition

In *The American College*, Summerskill (1962) reviewed 40 years of college dropout research. Citing 35 studies conducted between 1920 and 1960, Summerskill disclosed, in a decade-by-decade analysis, a 53-percent dropout rate for the 1920's and a 50-percent rate for the 1930's. During the 1940's and 1950's, the rates of attrition were 49 percent and 51 percent, respectively. For the aggregate of these 35 studies, a median student loss of 50 percent was reported.

Success among students at the graduate level remains largely unexplored. In one notable exception, Wright (1964) traced the progress of 176 graduate students for 11 years. Of 115 master's candidates enrolling in 1950, 46 received no degree, 58 earned the hoped-for master's degree, and 11 completed a doctorate by 1961. Of the 61 Ph.D. aspirants studied, 20 successfully completed the doctorate within 11 years, 8 terminated their studies with a master's, and 33 failed to earn any further degree, although 19 of the 33 already had a master's degree at the time of enrollment. In a search for determinants of graduate school success, Wright found intellectual endowment to be not significantly tied to the acquiring of a master's degree. A relationship between the student's social adjustment and his success or failure was reported. The candidate's age was correlated inversely with the earning of a graduate degree. Because success in Wright's study was defined as the securing of the desired degree within an 11-year period from the institution of first enrollment, students who may have transferred to other universities or those still enrolled in a degree program at the same university were not identified.

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College Factors Related to Withdrawal

Personal and precollege variables, such as high school rank, performance on aptitude tests, socioeconomic background, and hometown location and size, have been identified as predictors of undergraduate success (Summerskill, 1962). Examining the dropout pattern of 1,080 National Merit Scholarship competitors, Astin (1964) explored the extent to which the college itself may influence the mortality and survival of students. Making use of 11 college characteristics, including affluence, size, and various orientations such as intellectual and social, as well as 6 dichotomous variables representing types of institutions, Astin reported no significant relationship between characteristics of an institution and the rate of attrition among gifted male students. Among females, the institution's masculinity rating heightened the dropout probability. This departure of females from colleges with predominantly male student bodies may occur, Astin reasoned, either because such institutions provide increased opportunities for dating and early marriage or because female students find the intellectual climate at masculine institutions personally incompatible.

In a contextual analysis of academic failure, Nasatir (1963) studied the dropout rate of 1,782 University of California (Berkeley) freshmen who lived in six dormitories to which they had been nonpreferentially assigned. In four of the six units even the physical facilities were identical, yet Nasatir found the failure rate among the dorms to range from 0 to 56 percent. Although Nasatir concluded that college success or failure was determined by the interaction of the individual and the social context, this conclusion was drawn from data that were not treated to reveal the possible interrelations of the variables.

Redefinition of the College Dropout

Typically, college attrition studies have defined the dropout as one who fails to receive the bachelor's degree from the institution of first enrollment within four years after matriculation. Such a definition fails to distinguish between a student's withdrawal on a temporary basis and his permanent loss to higher education.

Research completed since 1960 has suggested that to restrict the study of the dropout to a single institution and a four-year span may be incompatible with actual student behavior. Jex and Merrill (1962) revealed, for example, that although only 20.2 percent of the 1948 University of Utah entering class graduated on schedule, 45 percent of this class did graduate from the University within 13 years.

In a more comprehensive study, Eckland (1964a) traced the academic careers of 1,180 male University of Illinois students for 10 years. Although 586 students, 49.7 percent of the total, received a degree following a period of continuous attendance, only 33 percent of the graduates actually completed their degrees within four years. Of the 594 students (50.3 percent) who left college before graduation, 417 graduated from *some* college within 10 years. In addition, 60 of the dropout students held senior standing when the study was terminated, and the investigator judged them to be potential graduates. In short, approximately 70 percent of the original freshman class received a baccalaureate degree within the 10-year period.

Eckland (1964b) argued that variables often used as dropout predictors may be of limited service if a student dropout is defined as one who permanently withdraws from college. Fifteen items frequently associated with undergraduate success or failure were classified as either intellectual or nonintellectual. An attempt was made to determine the power of each item to predict each of four levels of achievement: low achievers (freshmen who failed), early dropouts (students who left college during the first year), all dropouts (all students who left higher education and did not immediately re-enroll), and permanent dropouts. Intellective factors such as high school rank, aptitude tests, and college grades did correlate highly with college persistence, but the predictiveness proved unstable. High school rank, for example, was twice as effective in predicting a student's initial dropout as it was in predicting the permanency of such departure. Among nonintellective factors, some forces generally presumed to bear upon college performance (i.e., parents' income, religion, and hometown) actually reversed their predictive direction; e.g., although the initial dropout from college was directly related to a suburban background, staying out of college permanently was inversely related to suburban origins. Eckland concluded that predictive items often associated with college attrition may fail to predict the return and graduation of the dropout. In a few instances, an item's power to predict ultimate graduation was annulled completely when allowance was made for dropouts who returned.

Thus, recent studies indicate that it is incorrect to assume that eight consecutive semesters are the normal progression to graduation; the American college student may complete undergraduate study at more than one institution over a longer period of time. This shift in attendance patterns has implications for the theory and design of future research in the field.

Changes in Knowledge and Cognitive Skills

Although acquiring information and developing cognitive skills are highly regarded aims of education, colleges rarely determine directly and empirically the extent to which these objectives are achieved. Course grades are the accepted index of academic progress, and passing marks at the end of each term are judged to be a priori evidence that the amount of knowledge has been expanded and the skills of cognition sharpened.

Grades

One recent study completed by Aiken (1963) revealed the extent to which grades are a relative and unstable indicator of scholastic ability. While the academic capability of students who entered an unnamed college increased significantly over a three-year period, the grade point averages for these classes did not improve. Even though each class admitted was more gifted than the previous class in terms of scores on the *College Entrance Examination Board Scholastic Aptitude Test (SAT)* and high school rank, the college grades earned by classes of different ability remained the same. Aiken concluded that faculty grading practices were based not on constant standards of ability but on a relative class curve that shifted from year to year.

In a three-year panel study of a single class at Hampton Institute, Fisher (1961) failed to confirm the hypothesis that a student's grade point average will improve from year to year. Although the trend in achievement relative to grade point average was generally upward, only 29.5 percent of the class consistently received better grades from the freshman to the junior year, and 12 percent of the class showed a downward trend in grade point average.

Holland (1961) and Locke (1963) challenged directly the use of grades as the only measure of academic progress. Holland developed an achievement scale based on the number of original papers published, prizes won, and inventive projects completed by the student and found that these creative achievements were unrelated to grades. In parallel findings, Locke reported that academic success as judged by self-initiated activities performed outside the classroom did not correlate with academic performance in the structured classroom situation. Both writers called for the development of more adequate student achievement criteria.

Two studies during the review period focused on the relation of the student's grade point average to cultural and demographic factors and to special institutional programs. In his investigation of 66 students enrolled in a credit-by-examination program at the State University of New York at Buffalo, Chapman (1961) noted no significant difference in grade point average between an accelerated group, who received course credit by examination, and a control group, who completed a regular sequence of courses at a conventional pace.

Ramsey (1962) found that differences in academic behavior among Harvard Law School freshmen drawn from five types of undergraduate colleges were a correlate primarily of undergraduate grade point average. Differences in academic performance also were related to father's occupation, family income, type of secondary school attended, religious affiliation, and region of residence. Although there were moderate differences in average undergraduate college grades for groups of students of the same high ability level who belonged to identifiable subcultures, these group differences in grade point average tended to disappear in law school—a leveling outcome which Ramsey hypothesized to reflect different student perceptions of what the school environment required. He concluded that individuals with contrasting cultural orientations perceived academic roles in different ways and that these perceptions shifted during the student's academic career.

Critical Thinking Ability

Since 1960, changes in critical thinking ability among college students have been investigated. Two comprehensive reports prepared for the U.S. Office of Education (Lehmann and Dressel, 1962; Lehmann and Dressel, 1963) as well as a published condensation of this research by Lehmann (1963) disclosed a significant shift in the critical thinking ability of 1,051 Michigan State University students. A test consisting of 52 verbal problems designed to measure five critical thinking factors was administered to one class at matriculation and again during the senior year. Significant differences in test-retest mean scores indicated improvement in the ability to define a problem, select pertinent information, recognize stated and unstated assumptions, draw valid conclusions, and formulate and select relevant hypotheses.

Aptitude

Although the intellectual capacity of students is often assumed to be stable during the college years, Webster, Freedman, and Heist (1962) argued, both from theory and from empirical data, that for freshmen the capacity to learn is in a highly undeveloped state and that shifts in such ability can be expected, especially among highly gifted students. Nichols (1964) reported on the test-retest performance of 381 high ability students on the verbal and quantitative sections of the *Graduate Record Examinations (GRE) Aptitude Test.* Increases in the aptitude scores of students from the freshman to the senior year were noted. The improved performance was correlated with the type of college attended and especially with the student's major. Students majoring in economics, mathematics, and chemistry showed increases in their quantitative scores relative to their standing on the verbal scale, whereas students majoring in humanities tended to increase their verbal scores relative to their quantitative scores. Nichols suggested that shifts in ability, insofar as such are indicated by mean score responses on the *GRE Aptitude Test,* reflected the impact of the study program into which the student had been channeled.

Changes in Personality

Empirical data recently summarized in two research surveys clearly indicate that changes in personality occur among college students. With few exceptions, however, such conclusions were drawn from studies that employed a limited number of tests and scales. In most studies, it was impossible to determine the extent to which the college influenced student changes, since changes among noncollege populations were not investigated.

In *The American College,* Webster, Freedman, and Heist (1962) reported that recent research reveals personality alterations among college students to be in the direction of greater liberalism in political, social, and religious attitudes and toward less authoritarianism and greater self-expression in personality development. In *Impact of College,* Freedman (1960) relied heavily on Vassar College data to support generalizations regarding college impact on student development. After four years at Vassar, students tended to be (a) more mature but less stable, (b) less feminine, (c) less authoritarian and more tolerant, and (d) more liberal in religion. Webster, Freedman, and Heist (1962) reported on the use of three of the Vassar College scales—social maturity, impulse expression, and developmental status—at other widely separate women's colleges; without exception the trends revealed in the Vassar findings were confirmed.

More recent empirical research and descriptive studies confirm that changes in selected dimensions of personality occur among young adults during college years. In five independent longitudinal studies, Rokeach's Dogmatism Scale was administered to students who sought admission to or who entered a Roman Catholic university (Foster, Stanek, and Krassowski, 1961), a private liberal arts college (Parkes, 1962), six California junior colleges (Telford and Plant, 1963), a state college (Plant, 1962), and a large public university (Lehmann, 1963; Lehmann and Dressel, 1962). This same instrument was readministered two and/or four years later, and in all cases the retest means earned in the Dogmatism Scale were significantly lower than were the precollege means. Both males and females became more open-minded and more receptive to new ideas after two or more years of college.

A reduction in ethnocentrism over four years also was reported by Lehmann and Dressel (1962) and by Lehmann (1963). Scores on an inventory of beliefs revealed that both males and females became less stereotyped in their beliefs from the freshman to senior year at Michigan

State University. The move was toward more flexibility and less rigidity. On the other hand, a study by Foster, Stanek, and Krassowski (1961) did not reveal a correlation between a decrease in ethnocentrism and duration of college attendance. As Lehmann and Dressel (1963) proposed, however, this latter finding may reflect the somewhat homogeneous religious posture of the sample tested.

An intensive empirical and descriptive study at Sarah Lawrence College (Murphy and Raushenbush, 1960) traced the progress of 46 girls from the freshman through the senior year. Data obtained from faculty interviews, as well as from various psychological and ability tests, led the investigators to conclude that during the four Sarah Lawrence years 39 of the 46 students had developed a strong sense of social responsibility, gained confidence in personal relationships, and developed clearer self-roles.

In his attempt to evaluate the impact of a specific curriculum on non-intellectual changes among college students, Plant (1964) administered measures of dogmatism, ethnocentrism, and authoritarianism to freshmen who had been invited to participate in a special humanities program at San Jose State College. After two years, mean changes on the three scales were reported, both for those who had completed the program and for students who had elected to enter the college's general education program. Although both groups changed significantly toward decreased dogmatism, ethnocentrism, and authoritarianism, the humanities group had the larger net gain. Reservations must be made regarding both the process of selecting participants and the introduction of a possible Hawthorne effect associated with the uncontrolled enthusiasm in the experimental group.

Longitudinal studies under way at the Center for the Study of Higher Education at Berkeley concern attitudes toward civil liberties and academic freedom held by students at three liberal arts colleges. Although McConnell (1962) reported significant attitude differences from campus to campus, he concluded that, in general, freshmen are less permissive than seniors and that the change from the freshman to the senior year is toward a more tolerant position regarding matters of civil liberties and academic freedom.

Control Groups

The most significant development during the review period has been the inclusion of control groups in studies designed to investigate changes among college students. In the December 1964 issue of the REVIEW, McCullers and Plant reported on two investigations (Plant, 1962; Telford and Plant, 1963) in which both a college and a noncollege population of young adults were studied to determine whether results obtained were attributable to college experience or to noncollege factors. In the first of these studies, Plant not only tested after four years students who had enrolled and persisted at San Jose State College but also readministered three personality scales to subjects who had attended college for more limited periods or who had not attended. He noted that not only students who had attended college one or more semesters but also young adults who had not attended college became less dogmatic, less ethnocentric, and less authoritarian during the four-year period.

Telford and Plant (1963) administered the *Study of Values*, the Dogmatism Scale, and five scales of the *California Psychological Inventory (CPI)* to all students applying for admission in 1960 to six junior colleges. A sample of 1,713 students, retested after two years, were grouped by sex and by level of college attendance. Young people not attending a junior college were grouped together, as were those who had enrolled for one year or less and those who had attended three or four semesters. During the two years there was a reduction in dogmatism for all students, irrespective of the period of college attendance. Similarly, neither college enrollment nor length of attendance was related to test-retest changes on the five *CPI* scales. The results for the *Study of Values* revealed greater variability than the results for *CPI*. Because of its structure, however, the use of the *Study of Values* as a test-retest instrument may be questioned. Telford and Plant concluded that, except for the data found for the *Study of Values*, all sex and educational attainment groups changed to a significant degree and in the same direction, irrespective of the duration of college attendance.

Control groups also were included in an empirical study at Michigan State University. In this investigation all subjects attended the University but for varying lengths of time. Students enrolling as freshmen in the fall of 1958 were tested by Lehmann and Dressel (1963), who used, among other instruments, an inventory of beliefs, an inventory of values, and the Dogmatism Scale. Four years later both an experimental group composed of students who had spent four years at Michigan State University and a control group composed of students no longer enrolled at the University were retested. For purposes of analysis, the control group was further divided into three subgroups: (a) subjects who had attended the University for less than one year, (b) subjects who had been enrolled for more than one but fewer than two years, and (c) students who had attended the University for more than two but fewer than three years. When the experimental group and the three control groups were compared, the following major trends emerged: (a) For both males and females, stereotyped beliefs decreased significantly between 1958 and 1962, regardless of the amount of time spent in college. Only for females was the length of college attendance related to the intensity of change. (b) Males and females in both the experimental and control groups became less dogmatic and more receptive to new ideas over the four-year period, but length of college attendance was not related to the extent of change. (c) Students of both sexes who had attended college continuously for four years became more flexible and relative in their system of values, whereas those attending college for three years or less became more traditional in their value orientations.

Student Values in Relation to College Behavior

Following another theoretical formulation, Bidwell and others (1963) argued that the value structure which the student brings to college determines to a greater degree than any other factor the nature of his undergraduate career. After typing students as either *traditional* or *emergent,* the investigators studied three sets of variables: the student's value commitments, his system of personal goals, and his behavior in the college setting. The student's values were reported to be predictive of such undergraduate behavior as choice of major, peer relationships, extracurricular activity, and future career plans. The researchers concluded that personal value commitments move the student with ever-increasing selectivity toward predicted behavior in both the academic and extracurricular spheres.

Evaluation of Previous Conclusions

The widely discussed Jacob survey, reviewed at length by Bloom and Webster in the October 1960 issue of the REVIEW (pp. 326-27), suggested that although sociological forces are at work on the college campus, basic values of students remain largely unaffected. The appearance of numerous subsequent studies in which changes among the college population were identified with respect to both attitudes and values as well as with respect to more generalized dispositions of personality led Sanford (1962, p. 806) to assume a more hopeful view concerning the impact of college experience than that adopted by Jacob. Research findings now indicate, however, that changes among students heretofore attributed to college factors may in fact be developmental changes that occur among brighter than average young adults irrespective of college attendance. So viewed, the college experience may act simply as a catalyst to speed changes that would occur ordinarily as the individual matures (Plant, 1962; Plant and Minium, 1964). As yet, neither those personality outcomes classified as uniquely collegiate nor those factors of the college context that may significantly influence attitude and value changes of the student have been precisely located (Lehmann and Payne, 1963).

Changes in Educational and Vocational Goals

College students frequently change majors and revise plans for further schooling, but the forces responsible for shifts in aspiration were not accurately identified during the period under review. Several studies indicated that college environmental factors determine future degree plans, whereas others suggested that the so-called productivity of a college reflects primarily the characteristics of the students it admits.

Academic Major

Pierson's (1962) survey of bachelor's degree candidates at Michigan State University revealed that 30 percent of the class of 1958 graduated in majors other than the ones selected upon entering the University. The most frequently named reasons for changed majors were (a) lack of knowledge about the extent of curricular opportunities in the University, (b) content of courses in the original major, and (c) the requirements in vocations related to the major originally selected. Eighty-five percent of the students indicated no dissatisfaction over the consequences of having altered their programs.

In a longitudinal panel study, Selvin (1963) analyzed 582 University of California (Berkeley) freshmen to determine how changes in occupational plans during the first two college years related to the influences of five residential subcultures: university dormitories, fraternity houses, cooperative houses, apartments, and residence at home. Although the majority of men living in all types of housing except the university dormitories changed vocational plans, the pattern of change differed from one housing unit to another. Fraternity men tended to forsake medicine and engineering for law. Apartment men tended to shift to college teaching, whereas fraternity men did not. Even though the variables in the study were complex, Selvin concluded that students do change vocational choice during college and that the subculture with which they are identified does affect career plans.

French (1961) investigated the extent to which a student's level of aptitudes and intensity of interest in a field of study were related to satisfaction with his academic major. Graduates from three colleges, divided on the basis of self-reported satisfaction or dissatisfaction with the major field, revealed that satisfaction could not be predicted from aptitude test scores, whereas the interest of a student in his chosen field as recorded during the freshman year did relate to his satisfaction with the major as a senior. The largest proportion of satisfied students was in the natural sciences, whereas the largest fraction of dissatisfied students appeared in the social sciences.

Educational Aspiration

Thistlethwaite (1960) compared the academic major and level of aspiration of 1,500 college juniors with the educational plans which these students recalled that they had had before college. Over the three-year period, 48 percent of these National Merit Scholars revised upward their goals for further education while they were in college. Students had freely shifted to new fields of study, with the natural sciences holding more declared majors than the biological sciences. However, both these fields attracted new students less frequently than did the humanities. Student testimonials and ratings of faculty press by means of Stern's *College Characteristics Index (CCI)* were used to support Thistlethwaite's conclusion that college professors significantly affect the vocational choices of students.

A subsequent study of National Merit Scholarship competitors by Thistlethwaite (1962a) again linked the faculty to shifts in the graduate training plans of students. After two years of college, 33 percent of the subjects increased their levels of aspiration, whereas the educational goals of 9 percent were lowered. The majority (58 percent) did not change their aspiration levels. After employing an analysis-of-covariance procedure to control for noninstitutional variables, Thistlethwaite concluded that the academic goals of the student were influenced by (a) supportive faculty members, (b) the student's participation in an honors program, and (c) members of the faculty who pressed for independence, creative activity, and initiative among students.

Whereas Thistlethwaite (1962b), in a third study, sought to extend and to confirm his findings, Astin (1962) challenged both the methodology and the statistical procedure employed in this research. Especially objectionable was the technique of asking students to recall, after three years, their precollege educational goals. In his own attempt to explore the impact of college on the student's educational plans, Astin (1963a) launched a four-year panel study of 6,544 high aptitude students attending 82 institutions. Twelve separate college variables were tested, and an input-output design was employed to control for 21 separate noninstitutional factors. Astin reported that aspiration for the Ph.D. degree appeared to be negatively affected by (a) student body size, (b) percentage of males in the student body, and (c) the conventional orientation in the college environment. A complex relationship also was noted between the social orientation of a college and the extent to which students raised their levels of aspiration in terms of reporting an intention to earn the Ph.D. degree.

In a companion study, Astin (1963b) investigated the relationship between characteristics of the college and the decision of 1,548 students to pursue a career in science. Six factors from the Environmental Assessment Technique (described in Chapter II of this issue of the REVIEW) plus four other general characteristics—affluence, size, homogeneity, and masculinity—were used to assess the college. Astin reported that, for male students, men's colleges in the Northeast influenced negatively the science-bound student, whereas technical institutes and public universities exerted a positive impact. Among female students the affluence of the college appeared to be negatively correlated with the selection of a science career. Since, in the main, the degree of correlation between college characteristics and career choice was meager, Astin concluded that precollege student characteristics appeared to be much more important as career determinants than were the characteristics of the college attended. Sustaining this conclusion in a subsequent study, Astin and Nichols (1964) found that the types of rewards and satisfactions sought by the student were the strong determinants of vocational choice.

Persistence of Change

The extent to which developmental changes during the college years are maintained after graduation has not been extensively examined, although Freedman's (1962) chapter in *The American College* should serve for some time as a reference for past research. In his review of the study of young Vassar alumnae, Freedman concluded that developmental changes during the college years do persist among graduates. No large-scale shifts in ideology or attitudes among alumnae were reported. Three to four years after graduation the only significant personality changes were in the direction of greater emotional stability, less anxiety and depression, and general psychological well-being. Since personality stabilization among Vassar students actually began after two years of college, Freedman observed that Vassar juniors and seniors, viewed developmentally, were closer to young alumnae than to freshmen and sophomores.

Two other empirical studies examined the stability of, or change in, attitudes of older graduates. Using the California F and E scales, Freedman surveyed Vassar graduates for various decades, going back as far as 1904. Substantial differences among groups were recorded. For example, the class of 1904 measured significantly higher on the F and E scales than did the class of 1914. Since no consistent decade-by-decade trends were apparent, however, Freedman inferred that differences from class to class noted at the time of testing were not due to age but reflected differences present at the time of graduation that had persisted over the years.

Testing another alumni group, Rettig and Pasamanick (1960) reached quite a different conclusion. Responses from the 1932, 1942, and 1952 classes of Ohio State University alumni to a 50-item moral-judgment scale revealed shifts in standards of morality from year to year which these investigators interpreted to be related to age. Severity of judgment on the basic and economic morality scales correlated positively with increased age of alumni, whereas religious morality judgments varied curvilinearly. Religious judgments of college students and of older alumni were similar and more severe than were the responses of 40-year-old alumni. These findings, according to Rettig and Pasamanick, support the proposition that among college graduates severity of judgments in basic and corporate moral issues varies significantly with age; the older the graduate, the more severe the judgments.

Since both the Freedman and the Rettig and Pasamanick studies employed a cross-section design to study an age range of alumni that spanned the century, the attitudes of these classes at the time of leaving college are not known. Thus one can only speculate regarding the degree to which the earlier value systems persisted or changed.

Conclusion

Research during this review period has served to modify earlier notions regarding the impact of college life and to identify major issues yet to be explored. For example, a clear and useful distinction has been drawn between students who temporarily leave college and those who permanently withdraw. In light of this, prior estimates of the number of students who drop out of college must be revised. Further, selected changes in student personality heretofore attributed to college attendance now appear to be dimensions of maturation that occur among both college and noncollege young adults.

In general, this period of research has been more successful in challenging old assumptions regarding the outcomes of college than it has been in establishing new generalizations. This achievement is useful but not sufficient. College attendance is culturally valued, and a sustained expansion of higher education is predicted. It seems reasonable to urge, therefore, that the nation's enthusiasm for higher learning be equaled by a commitment to study empirically the educative process. This research effort should be directed toward the identification and unification of the ways in which colleges and universities influence students and the forces on campus that assist or hinder institutions of higher learning in the fulfillment of their ambitious goals.

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CHAPTER IV

Educational Programs

RALPH R. FIELDS, JOHN W. MASTIN, and JAMES P. WALSH

Because of the coverage in other chapters, the present review is confined to certain aspects of the educational program: general and liberal education, community college programs, flexibility in undergraduate programs, and curriculum development.

During the period under review a number of general works have appeared that are helpful to the student of curriculum in higher education. The *Encyclopedia of Educational Research*, edited by Harris (1960), is a thorough review of, and contains helpful discussions and bibliographies on, a number of topics closely related to programs in higher education. *The American College*, edited by Sanford (1962), includes treatments of many problems in higher education. The *Handbook of Research on Teaching*, edited by Gage (1963), contains a significant review by McKeachie of research on teaching at the college and university level. Hofstadter and Smith (1961) have brought together a valuable and useful collection of materials in the two volumes of *American Higher Education: A Documentary History*.

General and Liberal Education

The literature on general and liberal education is characterized by apology, criticism, polemic, and a continued search for values. The pressures of numbers, the changing goals of students, and the necessity for economical college management have led critics to suggest that curriculum and program revisions are needed if general education concepts and the liberal arts college are to survive. Implicit in the literature is the suggestion that research in general education must seek new instruments and question the assumptions on which curriculum development is based. It is not without reason, then, that studies, though meager, are provocative and deserving of scrutiny.

Acknowledging that general education has been criticized by those who draw conclusions from poor examples, Mayhew (1960), in the volume *General Education: An Account and Appraisal*, attempted to consolidate widely accepted features of general education to arrive at an empirically based definition. The eight contributors to the volume provided a guide for considering the establishment or improvement of programs of general education. Thomas (1962) placed general education in a historical context to explain the diversity and unsolved problems of contemporary practice. Current thought and practice were represented in the programs of 18 colleges and universities diverse in size, sources of support, character of student body, scope of educational activities, and age and tradition of the institution.

Sanford (1962), as part of a study sponsored by the Society for the Psychological Study of Social Issues, edited a substantial volume in which the findings and conceptions of psychology and the newer social sciences are brought to bear upon the processes of education in college. Critical of the tendency of colleges to be governed by tradition and dogma, the contributors examined systematically the liberal arts college as a social institution and its effect on the personality of the student. In the same volume, Katz and Sanford (1962) viewed the liberal arts curriculum as too often based on assumptions or as a body of knowledge identified with the curriculum of the graduate school.

The role of general education drew varied interpretations. Cowley (1960) cited the belief in some quarters that general education properly belongs in secondary schools. He cited the disinterest of a substantial portion of faculty members, the dominant status of the research function, and the present major system as tending to emphasize special rather than general education. DeVane (1964), noting the trends toward early and narrow specialization as more students press toward graduate and professional schools, expressed concern that the widespread advanced placement movement may sacrifice the cohesive effect of the common curriculum in the early years of college. However, to the extent that secondary schools relieve colleges of basic studies such as English composition, calculus, and foreign language, DeVane stated, advanced placement had merit. Conceding that honors programs and advanced placement reflect sound educational standards, Haywood (1963) concluded that the average or above average student could expect less in other courses. Siphoning off the best faculty members to teach the best students reduced the quality of the rest of the program by presenting unequal opportunity to unequal talents. On psychological grounds, Vallance (1963) suggested reversing the order in the liberal arts program to permit concentration in a selected field in the first two years and liberalization in the junior and senior years, when intellectual powers are more mature.

In a study restricted to cataloged documentation of 28 liberal arts colleges, Rudy (1960) found a trend in which general education was confined in varying degrees to the first two years, followed by specialized and even professional training. Reflecting this emphasis, faculties were organized on the basis of specialized department areas of scholarly and professional interest. In only a few nationally renowned liberal arts colleges and Catholic colleges was the trend less sweeping. St. John's College, Annapolis, Maryland, represents a case having little influence on the main line of development.

McGrath (1961, 1963a) studied the curricula of 14 independent liberal arts colleges and the related costs of instruction. He found that subject matter splintering and course proliferation produced not only a meager body of undergraduate common instruction but also many courses of a postgraduate character with few students and an overworked and underpaid faculty. By managing the curriculum more economically, reducing course offerings, and increasing enrollments, the colleges studied could raise salaries and reduce teaching loads. The view that faculties had the major responsibility for revising curriculum and reducing course offerings to defensible bounds was shared by Thomas (1962). McGrath (1963b) further viewed advanced placement as promoting early specialization to the extent that some colleges unwittingly had become prep schools for professional and graduate schools; limiting students to upper ability levels was seen as changing the traditional constituencies of liberal arts colleges. He saw the future determined by a continuing concern for a considerable percentage of American youth beyond the top 10 percent.

Community College Programs

The period under review has been one of steadily expanding enrollments in institutions of higher education; the proportion of new students has increased more rapidly in two-year community colleges than in other types of institutions. Most of the publications dealing with community colleges, such as Keppel (1963), have tended to stress the rising importance of such institutions, but occasional questions and criticisms have been raised. Mayhew (1960) acknowledged that there were spokesmen who found the junior college a necessary, important, but intellectually inferior people's school. Because state universities were dependent on junior colleges for transfer students, he forsaw that universities would exercise influence, if not outright control, over junior college curricula. DeVane (1964) considered the elements of liberal education so valuable that he was unwilling to trust their attainment to junior colleges, most of which were not equipped "to evoke the liberal mind and spirit in sufficient fulness and depth."

General Studies

Several general treatments of the community college throw light on the movement and nature of the instructional programs. In the sixth edition of a series of directories published by the American Council on Education, Gleazer (1963) brought together the best available institutional exhibits of some 655 two-year colleges, more than 400 of which are public community colleges. An appendix presents information regarding the curricula offered by each junior college. Fields (1962), in addition to tracing the evolution of the community college from the earlier junior college movement, presented case studies of several institutions, including their instructional programs. Further, he analyzed the critical problem of who should go to a community college in light of the social, occupational, and enrollment trends, and the perplexing curricular problem of what vocational programs should be offered. Thornton (1960) traced the origins and the historical development of the junior college concept, examined its philosophical bases, and showed how this type of college represents a response to changes in American society.

Brick (1964), through a careful study of the history of the American Association of Junior Colleges, brought into focus many of the developmental and persisting problems of the community and junior colleges. The two-year college movement could profit by many more historical studies as it moves further into its second half-century of existence.

Two studies were carried out at the Center for the Study of Higher Education at the University of California (Berkeley). In a study of the diversity of American public higher education, McConnell (1962) presented an analysis of public junior colleges which is particularly valuable because of its perspective. Through an intensive case analysis, Clark (1960) shed a great deal of light on the problems which confront an institution that admits, and tries to provide programs for, all who wish to enter its doors. It is to be hoped that other studies will build solidly upon these two.

Programs

Unfortunately, relatively little research dealing specifically with the program of instruction has been reported during this period. A number of doctoral studies, reported in the *Junior College Journal* (1964) as completed or under way, dealt with such curricular aspects as the factors bearing on performance of low ability students, criteria for selective admissions policies, cost differentials in instruction, and staff morale. Programs in music, nursing, physical education, and other fields were also subjected to investigation, as were programed instruction and evening adult programs. Erickson (1963) reported the experiences and accomplishments of the Chicago City Junior College in its television offering, including some assessment of student characteristics, achievement, and persistence. In a national study of public and private junior colleges' curricular practices for low ability students, Schenz (1964) found that a much greater proportion of public community colleges than of private junior colleges accepted low ability students as their responsibility and made special curricular provisions for them.

Several other problems related to curriculum development were studied. Gross and Maynard (1962) examined the gaps and duplications as well as the evidence of articulation between the high schools and junior colleges in the area of social science. Harris (1964) dealt with problems of technical education. Nall (1962) examined the justification and some of the problems of terminal general education in the junior college. Rushing (1963) dealt with the establishment and use of advisory committees.

The accomplishments of junior college graduates are one of the important indications of the instructional quality of the institutions. Knoell and Medsker (1964) undertook a fundamental study of the problem of transfer between two-year and four-year institutions. Among their findings were that the characteristics of the junior college graduates were indeed varied; that the type of institution to which the junior college students transferred appeared to influence quite strongly the grades that were achieved; that the first semester in the new institution seemed to involve adjustment problems and a slump in grades, although steady improvement thereafter was normal; and that the graduation and persistence pattern was quite good, with 45 percent graduating in the allotted time and 31 percent still in attendance.

Although Johnson (1964) concentrated primarily on investigating faculty services inaugurated by junior colleges, his study illuminates many curricular problems. He reported a number of developments, practices, and trends based upon visits to a number of institutions, personal contacts and correspondence with junior college officials, and a review of the pertinent literature. The following bear directly on the program of instruction: (a) Junior colleges were beginning to develop instructional rooms with special facilities for teaching large groups. (b) Junior colleges were using a wide variety of technological aids to learning and developing instructional resource centers. (c) The use of programed learning materials was considerable and increasing. (d) Team teaching, independent study, and work-study arrangements were affecting junior college programs. (e) Innovations in class scheduling were appearing.

Semiprofessional and Technical Education

Throughout its existence, the two-year college has placed considerable emphasis upon preparation for occupational careers. Labels and titles continue to be troublesome. The term *semiprofessional* is being used to describe occupations between skilled jobs and professions. The terms *technician* and *technical education* are gaining popularity with two-year college people and have been increasingly used by vocational educators in connection with secondary school programs.

Many studies have been made of specific semiprofessional or technical education programs. Price and Barnett (1963) found that California junior colleges offer a wide range of programs in computer education. Light (1963) looked at a number of factors related to the need for health workers and developed arguments for additional programs in two-year colleges. Harris (1962) discussed the role the junior college president might play in developing vocational-technical programs and gave a rationale for such offerings. Kurtz (1963) stressed the need for technical secretaries and reported on the program developed in one college to meet the need for such secretaries.

One of the serious lacks in the development of semiprofessional and technical education is careful and considered development of experimental programs and systematic assessment of the results of such programs. Nothing comparable to the pioneer investigation by Montag (1959) was carried out during the period under review, but it is possible that the report by Harris (1964) could constitute the foundation for such undertakings in the future. Harris' analysis clearly indicates the magnitude of the task that should be undertaken by the community college.

Flexibility in the Undergraduate Curriculum

Cole and Lewis (1962) visited 13 institutions in 1958 and found that (a) advanced placement and advanced standing were promising methods of providing flexibility; (b) credit by examination was receiving increasing attention; (c) early admission was losing favor; (d) overloading was generally discouraged; and (e) honors programs were generally approved and productive. Radcliffe (1961) reviewed advanced standing and concluded that it has merit for motivating superior students and individualizing programs, although there is a marked lack of evaluative data. Hatch and Bennet (1960) reviewed the literature through 1958 on independent study and concluded that (a) such study is as effective as conventional methods but has not realized its potential, (b) there is a trend toward starting independent study in the freshman year and offering it to average as well as exceptional students, and (c) it is not a substitute for classroom learning. They also presented nine hypotheses for research.

Baskin (1960) examined a number of independent study programs and suggested that their real value lies in improved learning and individualized curricula rather than in economy of teaching resources as has frequently been assumed. In an experiment at Antioch College, Baskin (1962) tested the hypotheses that students in independent study courses would learn as much and be as satisfied as students in regular lecture-discussion courses. He concluded that (a) there were no significant differences in learning or retention after two years; (b) independent study need not be restricted to superior students; (c) achievement may depend on personality factors as much as on academic ability; (d) students were initially dissatisfied with independent study but became increasingly satisfied as they became accustomed to the technique; and (e) no real saving of instructor time was evident even though classroom time was significantly reduced in the experimental courses. Baskin indicated that the greatest benefits of independent study may be increased reliance of the student on himself for his education and the use of his resources. Dressel (1965) pointed out that the ability to study independently is a primary goal of higher education.

Chickering (1964) found personality factors to be more significant than academic ability in predicting success in independent study at Goddard College. Dearing (1965) reinforced the findings of Baskin and Chickering. Grollmes (1964) polled 850 colleges and universities in 1962. Of the 622 that responded, 356 had special provisions for superior students and 94 had four-year programs. Felder (1964) surveyed 520 four-year institutions and found that over 300 employed independent study programs. Goldberg and Kurland (1965) reviewed and summarized programs for abler students.

Although flexibility measures are receiving widespread acceptance in four-year institutions and are beginning to receive attention in two-year colleges, they are aimed primarily at exceptional students and are not, as yet, based on thorough research.

Curriculum Development in Higher Education

Trends and Examples

Criticisms of programs of general and liberal education have suggested substantial revisions in curriculum construction, with attention to extracurricular factors, testing, teaching aids, preparation of college teachers, and integrated courses. Mayhew (1960) viewed increased international awareness as a factor in the trend to increase foreign language and area study offerings. Carlin and Blackman (1960) reviewed curriculum developments at the Basic College of Michigan State University; they described in detail the changes made in communications skills, natural sciences, social sciences, and humanities. Significant is the fact that the Michigan State University program had to be adjusted to the university professional schools as well as to upper division specialities in the liberal arts departments. In reporting interim developments on such studies in graduate schools, Bigelow (1962) pointed up the effect of such studies on the undergraduate curriculum, with more than 500 colleges offering some instruction in the Russian language. Dressel (1963) reviewed the basic considerations in curriculum planning to establish principles for the undergraduate curriculum, with attention to administrative and budgetary procedures, sharing many of the views of McGrath (1961). Dressel's chapter on "The Education of College and University Professors" is brief and objective. Of more limited scope are the Lyda (1960) paper on curriculum development and the Denemark (1963) report from the Commission on Teacher Education, Association for Supervision and Curriculum Development.

Much future interest will be focused on the Beloit College plan presented by Hayward (1963, 1964). The key to the revised curriculum is a three-level (not freshman, sophomore, junior, senior), nine-term, four-year calendar providing on-campus, field, and vacation term experience. Economical operation is achieved by year-round operation with 50 percent more students but with only two thirds of the student body on campus in a given term.

Undergraduate curricula have had an increased relationship to the community college. Dressel (1963) noted a trend to eliminate from the four-year college occupational and skills courses of dubious academic respectability and to relegate them to the community college.

Scarcity of Curriculum Research

Curriculum study has not been accompanied by substantial research. Fahey and Ball (1960) evaluated the program in general education initiated in the Liberal Arts College of the University of Pittsburgh in 1955. Experimental students taking core courses in English, humanities, social science, and natural science did as well as the control group, and more of them graduated. There was no convincing support that they performed as well on subject matter and critical thinking tests as the control group. Although the subjects performed better on subtests in social science and humanities, they did not do as well in natural science. Brinker (1960) studied courses taken by liberal arts students in four liberal arts colleges of the Southwest to validate the presumption that a well educated liberal arts graduate should have at least an acquaintance with humanities, social science, and natural science. The study found that humanities and social science majors failed to obtain an elementary acquaintance with disciplines in other fields and that graduates of three of the colleges concentrated in their majors, sacrificing breadth for depth. There was some evidence that advisers were motivated to enhance the prestige of their own departments rather than to see merit in other disciplines.

Curriculum Change: Factors and Process

A few studies dealt with the factors in curriculum change in institutions of higher education, or with the process of changing the curriculum at any level. This is an area of investigation badly in need of serious research; any attacks on the problem of change are indeed welcome.

Goodlad (1964), as a result of a careful analysis of the "curriculum reform movement," formulated recommendations that would tend to bring the separate discipline approach to curriculum building into a relationship with the total program. Since a somewhat similar problem of disparity exists at the college level, his analysis is worthy of consideration by students of higher education.

Katz and Sanford (1962) maintained that in spite of its importance the "curriculum rarely has been made the object of systematic investigation." The major point expressed was that continuing experimentation is a great need.

Miles' (1964) analysis of the nature of educational innovation and the accounts brought together in the volume entitled *Innovation in Education* are suggestive of the complexity of change as well as of possible approaches to implementing it.

Johnson (1964), by his accounts of innovations in community colleges, underlined the many and varied shapes that changes in instruction take. It is apparent also that changes in teaching result many times in program changes. The increasing introduction of new media constitutes mounting pressure for program change. The analysis by Brown and Thornton (1963) brought together much helpful information on the nature and extent of new media in college instruction.

College curricula respond to the climate of public opinion, and the statement of the Educational Policies Commission (National Education Association and American Association of School Administrators, 1964) setting forth the goal of universal education beyond high school may portend a future wave of curriculum change in at least some of our institutions of higher education. Such a possibility makes the study by Clark (1960) of great interest.

Finances have always affected the nature of the curriculum, but Hungate and McGrath (1963) contend, in their analysis of the potential of the trimester arrangement, that educational considerations must come first. Based on the careful analysis of data from studies of two-semester instructional arrangements, they proposed a 14-week trimester arrangement leading to the bachelor's degree in three years. They reported several advantages besides the student's saving one year: better spaced breaks for students and faculty; maximum periods of uninterrupted teaching time; increased faculty salaries because of increased faculty productivity; regular faculty leaves of a trimester every three years; substantial savings through greater use of facilities and administrative offices.

Observations

From this review of the research, no hard-and-fast conclusions appear justified, but some observations do seem warranted. Curriculum problems are persistent. The place and nature of general education are still unsettled, and articulation with secondary schools is a renewed concern. Faculty responsibilities in curriculum development do not appear settled. The need for more definitive research is a perennial one, especially in the area of curricula for higher education. It would seem that the increasing tempo of change should bring with it increased attention to experimentation and research as necessary to direct such change. There is some evidence that this is taking place, yet the very seriousness of the problems facing instructional leaders in institutions of higher education may make attention to research more difficult and less likely. Only conscious effort and cooperative planning by all concerned with curriculum improvement will suffice.

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CHAPTER V

Teachers and Teaching

RUTH E. ECKERT and DANIEL C. NEALE

Although swiftly mounting college enrollments have alerted even the lay citizen to the great shortage of faculty members and the consequent need for instructional adjustments, research on these problems continues to be restricted in scope and, in many instances, in imagination and scientific rigor. Of the several hundred articles and brochures published since 1960 on staffing and teaching problems, most describe current or recommended practices or urge a greater concern for quality—but they provide few principles to guide this quest.

Contributions of the period include significant ideas regarding theory and experimental design, an encouraging upsurge in a few types of studies, and occasional investigations which have set new and fruitful patterns for research. Hopefully, all these should stimulate better studies in the future. Some references are included here because of research merit; others suggest trends or illustrate the nature of the uncited literature.

The College Teacher

Spurred by a prospective need for 35,000 new faculty members annually in the late 1960's, a number of studies have probed the career decisions, preparation, status, services, and satisfactions of college teachers. A Western Interstate Commission for Higher Education (1961) symposium on *Studies of College Faculty* and articles by Adelson (1962), Katz (1962), and Knapp (1962) competently interpreted earlier findings and charted the way into this rich but largely unexplored territory.

Recruitment

A well planned study by Gustad (1960), based on questionnaire and interview data from college teachers and former teachers in selected fields in the Southeast, indicated that many people get into college teaching by "drifting" rather than by deliberate design. Eckert and Stecklein (1961), who studied Minnesota faculty members, and Hartung (1961), who investigated graduate students and college teachers of biology in the Northeast, reached a similar conclusion. Of special interest to future researchers is Medalia's (1963) critical review of three variables—"career decision," "occupational image," and "institutional potency"—involved in recent studies of faculty recruitment.

Interest in college teaching as a possible career appears to have increased substantially among undergraduate students during the past few years. O'Dowd and Beardslee (1961) found that students in five Northeastern colleges had a well defined and attractive image of the college professor and compared him favorably with all other major professional groups, a finding also stressed by Corcoran (1961) and Kinnane (1962), both of whom reported serious consideration of this field as a career.

Preparation

Although the controversy continues regarding appropriate graduate training for college teachers and some new programs have been instituted, evaluative studies are still lacking. Berelson (1960) concluded, from the extensive factual data and opinions gathered in his study of graduate education, that the current research-oriented Ph.D. program can properly continue to serve both the prospective teacher and investigator. In contrast, McGrath (1961) supported his plea for special programs for college teachers with information gathered from several hundred college presidents concerning shortages or lacks in graduate training. Recent efforts to study this situation by field, illustrated by Hartung (1961), who investigated biologists, and Perkins and Snell (1962), who examined the opinions and professional achievements of historians, should throw more light on this problem. A survey by Ewing and Stickler (1964) revealed that 91 leading universities—more than triple the number involved two decades ago—were currently offering courses on college teaching or other phases of higher education.

Orientation and In-Service Training

In a carefully designed study using questionnaires, supplemented with interviews in selected institutions, Tracy (1961) found that practically all accredited North Central colleges provided some faculty orientation. Half of these programs had been initiated recently, however, and very few were well developed. McCall (1961) and Gustad (1963), who also investigated orientation practices, confirmed Tracy's conclusion that new teachers in particular need help on instructional problems. Exploring role conflicts and congruences through successive interviews with new faculty members in a single institution, Allen and Sutherland (1963) similarly underscored institutional responsibilities for staff orientation. Only Miller and Wilson (1963) surveyed longer-range faculty development procedures, in a study of small Southern colleges.

Status and Services

Reports issued biennially by the National Education Association, Research Division (1963, 1964) and the U.S. Office of Education (Dunham and Wright, 1964) on the size, composition, and academic and economic status of the profession have improved steadily in quality and furnish valuable descriptive information for researchers. Also useful is the recently completed survey by Ingraham and King (1965) of "outer fringe benefits" in colleges and universities. Whether judged by salaries paid, associated benefits, degrees held, academic rank, or social esteem, the academic man is relatively better off than he was a few years ago. Bernard's (1964) study, which arrays evidences from statistical, biographical, and personal-documentary studies, competently correlates and interprets current knowledge about women faculty members.

Few investigations of the character and scope of faculty services have been reported recently, beyond those made for purely local use. While the largest share of time is typically invested in teaching and related student services, the pattern varies significantly by institution and academic rank. Some recent studies (*see* Orlans, 1962) suggest a marked movement of major staff members in large universities away from undergraduate teaching, but in most types of colleges it is research and scholarly writing rather than teaching that tend to be crowded out by other responsibilities. Stecklein (1961) and Doi (1961) have perceptively reviewed earlier efforts to measure faculty load and have suggested some refinements in techniques.

How faculty services should be evaluated continues to be a lively but not a seriously researched problem. The difficulties are well outlined in a study by Gustad (1961), who asked administrators throughout the country about the criteria they used in deciding upon academic promotions. Although teaching effectiveness received top mention, the six kinds of evidence used most often in judging this were all of the "hearsay" variety.

Satisfactions

As Medalia (1963) noted, studies of faculty satisfaction and morale need to be more clearly conceptualized. Differences in methods used may also partially account for the picture emerging from the study by Gustad (1960), which is less optimistic than several other recent studies. While most faculty members seem to like their jobs, a few leave the profession, probably because of motivational factors as well as unsatisfactory pay or work conditions (Gustad, 1960), and others shift positions, as Stecklein and Lathrop (1960) showed in their pioneering attraction-retention study at the University of Minnesota. Sagen (1963), using Murray's "needs-press" framework in investigating faculty satisfactions, found that both personality traits and institutional variables are significantly related to satisfaction with present position, a conclusion also supported by Allen and Sutherland (1963).

In general, recent studies of prospective and current faculty members have yielded illuminating knowledge regarding their backgrounds and current status, though much less has been learned about their interests, outlooks, and satisfactions. Judging from the literature, little study has yet been given to their roles, as individuals or organized groups, in the academic community. But promising hypotheses developed in these exploratory expeditions should, if pursued, yield knowledge about faculty comparable to that now available for college students.

College Teaching*

Unquestionably the finest single source for researchers interested in instructional problems is the *Handbook of Research on Teaching* (Gage, 1963), which provides excellent discussions of theories of teaching, designs for research, and measures of teaching and learning. Three decades of college instructional studies are incisively analyzed and interpreted in the concluding chapter, by McKeachie (1963). In another useful volume, *Theories of Learning and Instruction* (National Society for the Study of Education, 1964), current knowledge about learning is reviewed and its relationship to teaching discussed. Popularly written interpretations of recent studies, including some that do not reach regular publication channels, are provided in the U.S. Office of Education's "New Dimensions in Higher Education" series, edited by Hatch (1960-65). A second supplement prepared by Eells (1962) extended through 1961 his invaluable annotated bibliography, *College Teachers and College Teaching*, raising the total references covered since 1945 to 5,656.

Concepts and Theories of Teaching

A persistent criticism of research on teaching methods is that too often it has not been related to an adequate theoretical framework. Presumably the latter would help to clarify teaching method variables, relate learning theories to the complexities of educational settings, and stimulate more comprehensive studies of college teaching. In line with current efforts to develop such a framework for the entire field of education, Smith (1961) has re-examined the concept of teaching and suggested a fruitful model for studying "episodes" in the teaching cycle.

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The actual development of teaching theories remains in its infancy, not a surprising finding since such development must draw extensively from research and theories in the youthful behavioral sciences. In this connection, Gage (1963, Chapter 3) recommended that more use be made of prominent learning theories, e.g., identification, conditioning, and cognitive theories. Little application of the concept of identification has yet been reported, but conditioning theory has provided an important guide to research on programed instruction. Drawing upon Gestalt theories of learning, Ausubel (1963) has set up a series of controversial hypotheses about the teaching of verbal knowledge and supported some of these in pilot experiments with college classes. An interesting aspect of his theory is its stress upon the limitations of "discovery" approaches at the college level.

Several paradigms for research suggested in the *Handbook of Research on Teaching* (Gage, 1963) hold considerable promise for developing and testing such theoretical formulations. McKeachie (1961) and Siegel and Siegel (1964) have also argued persuasively for frameworks which relate measures of the college environment, personal traits of teachers and students, and method variables to instructional outcomes and encourage study of their complex interactions. Preliminary experimental tests (*see also* McKeachie, Isaacson, and Milholland, 1964) support such a wide-angled approach.

Although current teaching theories do not as yet have many implications for instructional practice, they are already serving as a promising guide to research. As these theories are expanded and refined through more vigorous experimentation, the relation of the behavior of teachers to the learning and personal development of students should become better understood.

Teaching Methods

No recent studies have surveyed the methods that faculty members generally are using in various types, sizes, and levels of classes to find out what innovations or adaptations have occurred with skyrocketing enrollments. And little new has been reported about the effectiveness of lecture and discussion methods; this probably reflects disenchantment with earlier studies. Experimental manipulations and comparisons of student-centered and instructor-centered classes also have waned. Independent study, which McKeachie characterized as one of "the glamour methods of the 1960's," also received less attention than might have been expected. In contrast, the literature on programed learning increased strikingly, and many studies, though of a somewhat different character than earlier, were made of televised instruction. An important influence on the course of research appears to have been the funds available for specific types of studies.

Lecture and Discussion Methods. No research projects comparable to the 1957-59 Miami University study of large-group teaching procedures (Macomber and Siegel, 1960) have been reported recently, but scattered comparisons generally support its findings that neither the initial acquisition nor the retention of learning is substantially affected by teaching method. Thus Leton (1961), in a limited comparison of lecture and group discussion in a course in child development, found no differences that could be ascribed to the procedures used.

A few studies attempted to appraise the effect of substituting group-led sessions for those which a teacher customarily leads. Based on studies in 11 departments at the University of Colorado, Hovey, Gruber, and Terrell (1963) found that the achievement of self-directed groups, meeting without an instructor for most scheduled sessions, was slightly superior, both at the course's conclusion and 10 months later, to that of conventionally taught students and that the experimental students were also more curious. Yet the control students typically gave more favorable course evaluations, suggesting that students, like instructors, tend to resist the unfamiliar. Other studies, confined typically to one or two courses, yielded similar findings. Scattered evidence also suggests that systematic training for student-led discussions improves these and general course achievement. But few studies have attempted to analyze the thought processes or verbal behavior of participants or even to identify major learning goals. It is not surprising that research findings under these circumstances are slim.

Independent Study. Provisions for independent study, both within and beyond regular courses, appear to be increasing. Felder (1964), who examined practices in four-year colleges, found that two thirds of the responding institutions currently had such provisions, and less than one half of these were restricted to superior students.

Antioch's carefully executed appraisal of independent study, reported by Churchill (1961), showed that students in seven first-level general education courses who spent approximately one half of the usual class time in independent study or small group meetings did as well and were as satisfied with the instructors and courses involved as were those who attended classes regularly. But all three methods produced little gain in "learning resourcefulness" or the achievement of skills and attitudes favoring continued independent study.

In comparisons made in several colleges, involving the use of independent study procedures in a beginning psychology course, the conventionally taught students did slightly better than the experimental students on regular classroom tests, but McKeachie and others (1960) noted that the latter students developed a greater interest and sense of involvement in the subject matter.

Although colleges are increasingly using off-campus learning experiences, research on their learning value is just beginning. Using chiefly student, faculty, and employer perceptions, Wilson and Lyons (1961) reported generally favorable conclusions from their appraisal of work-study plans in 17 colleges. Based on information obtained from American students and from educators in the host countries, Weidner (1962) suggested that the better student-abroad programs have a substantial impact in the areas of general cultural values, political and international attitudes, and personal maturity. Clearly there is fertile ground for research on these and other off-campus substitutes for conventional instruction.

Instructional Technology and Media. A remarkable feature of recent research on instructional technology and media is the swift change in emphasis from televised to programed instruction. Lumsdaine and May (1965) provided an excellent guide to the extensive literature in this area, much of which exists in mimeographed technical reports. Many reports of instructional media research conducted under the National Defense Education Act, Title VII, have been abstracted under the direction of Allen (1961-64).

Schramm's summary (in the April 1962 issue of the REVIEW, pp. 156-67) seemingly marks the end of the research era in which massive comparisons were made between televised lectures and other teaching techniques. Of 100 studies at the college level, Schramm found 3 that favored television, 13 that favored conventional instruction, and 84 that showed no significant differences in achievement. Attitudes of college students were sometimes negative but depended upon the subject, the teacher, and the type of viewer.

In the Chicago City Junior College studies reported by Erickson and Chausow (1960), television students, even those viewing at home, did as well as students in a face-to-face classroom setting. Student reaction to television was more favorable among home viewers and varied according to the subject of the course. Janes (1964) found favorable attitudes toward televised instruction in a social science course to be positively related to length of viewing experience, intelligence, self-confidence, degree of authoritarianism, and course grade.

Considerable interest has been shown recently in the use of television for special demonstration purposes. Evaluative studies, such as the one at Hunter College (Stoller, Lesser, and Freedman, 1964), have shown that televised demonstrations of classroom practices are as effective in teacher education as direct observation. Similar uses were reported in other professional programs.

Although there seems to be general agreement that additional gross comparisons of televised and conventional teaching are unnecessary, no substantial alternative research strategy for instructional television has clearly emerged. One promising approach is illustrated by Siegel and Siegel (1964), who are studying various ways to utilize television, taking account of different teaching objectives and different kinds of student viewers.

Another strategy, recommended by Lumsdaine and May (1965), emphasizes the investigation of theoretically-relevant instructional variables.

The past five years include almost the entire history of research on programed instruction. Of 190 studies reported by Schramm (1964), only 25 were made prior to 1960. Although many of these studies involved elementary and high school students, a significant proportion related to college-level instruction.

As in research on television, comparisons of programed instruction and conventional instruction have been popular. Despite the limitations of such comparisons, it is interesting to note that, of college-level comparisons reviewed, approximately one third favored programed instruction and none favored conventional instruction.

Carpenter and Greenhill (1963), who directed several representative studies at Pennsylvania State University, concluded that achievement in a mathematics and an English course was as good with programed materials as with conventional instruction. In a similar study, Ripple (1963) reported a significant advantage for programed approaches in elementary psychology. A common finding in such comparative studies is that instructional time is reduced when programed materials are used.

Another kind of comparative study is illustrated by Moore and Smith (1964), who tested various ways of presenting the Holland-Skinner program in psychology, such as using machines or programed texts, asking for written responses or merely having the material read, employing free-response or multiple-choice formats, and giving or not giving the student knowledge of results. As has been common in these studies, there were no significant differences on the criterion test between the various presentation groups. Even when they presented the programs to groups by filmstrips or television, thereby eliminating the usual self-pacing features, Carpenter and Greenhill (1963) could find no difference in learning outcomes. On the other hand, evidence exists that some ways of using programs may be more effective than others. Dick (1963), for example, found an advantage when students studied programs in pairs rather than singly.

Research on student reactions has been complicated by the great range in quality of programed materials and by the novelty of this approach. Robinson and Lerbinger (1963) reported generally favorable reactions to a programed workbook which supplemented a Continental Classroom course. But Banta (1963), who summarized evaluations of the same program at different institutions, found that student reaction varied significantly from college to college.

Despite the hope of psychologists that some problems of college teaching would readily be solved by programed instruction, its contributions as revealed by research in this field are as yet quite modest. Perhaps its major value has been to stimulate clear specification of objectives and continuing revision of instructional materials on the basis of student learning. For some aspects of instruction at least, programs can save time for both instructor and student, with no apparent loss in learning.

As reported by Lumsdaine and May (1965), research continues on the use of a variety of other audiovisual aids including films and audiotapes. In the college setting, particular emphasis has been given to evaluation of the language laboratory, which seems to offer definite advantages in foreign language programs stressing audiolingual skills. Scherer and Wertheimer (1964), who compared two years of conventional instruction in German with instruction using an audiolingual method and language laboratory facilities, found the latter produced superior speaking skills but inferior translating skills.

The central contribution of research on instructional technology and media in this period has been to help television, programed instruction, and language laboratories gain acceptance with college educators. A further task is to clarify how each of these can best be used in college instruction.

Student and Teacher Characteristics

The general climate for learning in a given college unquestionably affects student and instructor performance. However, no studies have systematically related this factor to the nature and quality of college instruction, and only occasional studies have explored the significance of student and teacher traits in influencing learning, even though these may account for much of the unexplained variance in achievement.

A few investigators (Gruber and Weitman, 1963; Siegel and Siegel, 1964), who have related students' scholastic aptitude or prior knowledge to teaching method, have not identified any consistent patterns, though their findings suggest intriguing interactions among these variables. In an important exploratory study of the influence of motivation on student learning, McKeachie (1961) found that the three motives investigated (affiliation, need for power, and achievement) interacted to some degree with teaching methods in influencing learning. Thus students who showed a strong affiliation motive did better in classes high in affiliative cues than in those with few such cues. This research has been greatly extended in the Michigan Project, *Research on the Characteristics of Effective College Teaching*. A preliminary report (McKeachie, Isaacson, and Milholland, 1964) confirmed the importance of motivational factors and other student traits in influencing instructional outcomes.

Little has been determined, beyond what was reported in the late 1950's, regarding faculty members' personal characteristics and the meaning of these for their teaching. Getzels and Jackson (1963) succinctly summarized theories of personality and assessed existing instruments and research possibilities, but in the period of this review only Corcoran (1961) and McKeachie, Isaacson, and Milholland (1964) examined specifically the characteristics of good and poor college teachers as seen by their students. Using an adapted version of Cattell's scales, Corcoran found that good teachers rate high in surgency (buoyancy and enthusiasm), comention (cultural interests), and cyclothymia (concern for people). Similarly, McKeachie, Isaacson, and Milholland (1964) discovered that young teachers who were ranked high by their peers on surgency, culture, and emotional stability were the most likely to be viewed favorably by students.

In another trail-blazing study, Solomon, Bezdek, and Rosenberg (1963) related eight factors, derived from reports by students and trained observers and actual tape recordings of teachers' behavior, to students' gains in factual knowledge and in comprehension. Findings from this study suggest, as do those reported by McKeachie, Isaacson, and Milholland (1964), that teaching styles do influence learning. But much more needs to be discovered about how teachers' personal traits influence their choice of methods and students' success and satisfactions in learning.

In general, recent studies of teaching methods and materials have, like their predecessors, yielded no clear-cut evidence of the superiority of any one approach. This unquestionably reflects problems in definition, design, and instrumentation; it also testifies to the strong common influence exerted by tradition and the competition for grades. Since students seem to acquire certain types of knowledge quite well on their own, teachers may properly stress skills of inquiry, interpretation, and application. And certainly innovations in teaching can be tried more boldly, without undue fear that standards of quality will be sacrificed.

Next Steps in Research

The major impression gained from a review of recent literature on college teachers and teaching is that research on these topics still claims far too little time, effort, and money. While a few excellent studies have emerged, educators lack carefully planned and cumulated research to guide decisions on staffing and instructional problems. Creative contributions made by isolated investigators need to be supplemented by campus-wide studies and by well mobilized regional and national efforts.

The start made in formulating theories of teaching should be vigorously continued in the years ahead. As theories are refined and effective ways are evolved to test them in college settings, they should contribute greatly to the improvement of teaching. The college faculty member, as well as the researcher, needs comprehensive and empirically supported theories to guide his efforts.

Progress charted recently in defining experimental variables also raises hope for the next decade of instructional research. Clearly, the many comparisons made using ambiguously defined experimental and control methods have added little to our knowledge of teaching and should not be continued. The experimental application of theoretically derived variables [*see* Lumsdaine and May (1965) and McKeachie, Isaacson, and Milholland (1964)] constitutes one promising approach to such sharpened definition. Another attack, which Gage (1961) cogently supported and which is well illustrated in the Solomon, Bezdek, and Rosenberg (1963) study, involves process-descriptive studies of teaching aimed at finding out what actually transpires in the classroom or laboratory. Further work along both these lines should aid in setting up meaningful experiments and in developing better theories of teaching.

Current concern for strengthening the subject content of college courses should also stimulate better studies of teaching. One reason why research on teaching has been rather sterile is that it has often been considered in the abstract, without reference to the particular subject content involved. As more knowledge is gained about the structure of individual disciplines, both teaching methods and ways of evaluating their effectiveness may need to be rethought.

Research patterns illustrated in some of the studies noted above also merit far wider application. More comprehensively planned studies will enable investigators to utilize a broad array of information on input, process, and output variables and to identify important interactions as well as main effects of the experimental variables. But, as Pullias (1963) counseled, preconceptions about acceptable methods of research should not restrict the investigator's vision. A fresh idea tested in a limited way may promote excellence in teaching far more than a sophisticated study lacking such imagination.

Better ways also need to be found to diffuse research findings and to encourage trial of promising teaching methods and techniques. Since students as well as professors tend to resist change, established behaviors are not likely to be modified because an occasional faculty member tries a new approach. Without more effective means for stimulating experimentation and putting findings to productive use, many faculty members will continue to cling jealously to methods developed in an earlier time.

Clearly a much broader concept of research on staffing and teaching is needed. If today's pioneering efforts to test theoretical concepts and relationships under normal class conditions and to encompass the multiplicity of factors involved are to be extended, such research must receive high institutional priority. Only a strenuous, across-the-board effort holds promise for any major breakthrough on today's massive instructional problems.

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CHAPTER VI

Noninstructional Services

JAMES K. WINFREY and DANIEL D. FEDER

In addition to a great increase in the number of articles published during the period covered by this REVIEW, increasing attention to research in this field is evidenced by the appearance of the *Journal of College Student Personnel*, a quarterly publication of the American College Personnel Association specifically addressed to research in higher education student-personnel service programs. Much of the literature in this field still is devoted to surveys of existing programs and efforts to identify differentiating characteristics. Although such research is essentially descriptive, close on the heels of such studies come efforts to identify outcomes of differing programs. This is perhaps best illustrated in the field of student housing, where research literature has developed more rapidly than in almost any other field with the possible exception of counseling (treated in the April 1963 issue of the REVIEW). As different ways of performing the same services are identified, a question inevitably following is whether one way is more effective than another, or whether different outcomes in terms of student learning, attitudes, and behavior result from the different methods of operation.

Programs and Personnel

Junior college literature is beginning to reflect the development of differentiated student personnel service programs (Robinson, 1960; Klitzke, 1960). Writers assume that there are important, characteristic differences in such programs as contrasted with those of four-year colleges and universities.

Scott (1960, 1961) compared programs of 16 liberal arts colleges of less than 2,000 enrollment with those of larger institutions and concluded that the principles governing the establishment and operation of student personnel service programs are much the same. He observed that methods of implementing the programs were quite different and that even among the small colleges these methods varied widely. Among the small institutions there were wide differences in budgetary support for similar functions. Smallness of institution and the presumed greater knowledge of, and contact with, students was not a guarantee of the existence of a well coordinated service system. Reynolds (1961) secured responses from chief student personnel officers in 60 percent of all coeducational liberal arts colleges in the United States under 2,000 enrollment and found that there has been a steady growth in the establishment of service units headed by a chief student personnel officer in such institutions since World War II. The respondents reported a median of 20 semester hours of graduate study in the field; they spent a median of 75 percent of their time on actual student personnel functions; and virtually all reported directly to the president of the institution. Although each of the recognized student personnel functions was performed by some of the respondents, those most often performed were personal counseling, discipline, and responsibility for student records. The wide variations observed indicated that the functions performed and the roles of those performing them were not well differentiated in the small institutions.

Smith (1961) surveyed the role and function of the chief student personnel officers in institutions with enrollments over 10,000. The most frequently encountered professional title was dean of students. Almost all these officers were responsible for discipline, orientation, student government, fraternities and sororities, housing, financial aid, student counseling, foreign student programs, and activities. In addition, two thirds of this sample reported being responsible for testing, placement, health services, and student unions. About one half reported responsibility also for veterans affairs, security and traffic, and admissions. About one third reported supervision of special therapy clinics and food services. The respondents all anticipated that their positions would become increasingly administrative with less opportunity for personal contact with individual students and that they would strive for increased faculty assistance in certain phases of these noninstructional programs. It was predicted that increased emphasis would be placed on student housing and financial aids.

Hill (1961) surveyed the available studies on the selection and training of student personnel workers to date, noting the high degree of self-selection of people into student personnel positions without well defined training patterns. He cited the need for more accurate role definitions and research on effectiveness of training programs for specific functions. Clark (1964) reported the development of a scoring scale for student personnel workers using the *Strong Vocational Interest Blank*. Using a sample selected from the active male membership of the American College Personnel Association, he derived a scale whose high validity and reliability coefficients lend confidence to its use. Similarities of interests to those of psychologists and social workers were noted with a distinctive pattern which could be used to improve selection of persons interested in the student personnel profession.

Reeves and Arbuckle (1963) and Reiske (1962) reported separate investigations of attitudinal differences among student personnel administrators and persons with counseling orientation. The former evidenced a higher degree of authoritarianism, higher persuasiveness, and less sympathetic and understanding attitudes than did counselors. The differences appeared to be fewer in number and less extreme as the amount of professional preparation among the student personnel workers increased.

Part of the process of establishing role identification has led to studies of faculty and student perceptions of programs. Fitzgerald (1962) studied faculty perceptions about student personnel services at Michigan State University. In general, faculty ranked the importance of personnel functions in relation to the degree to which each seemed to support the academic purposes of the institution. Even among tenured, long-service faculty members, however, there was marked lack of widespread knowledge, and this was more manifest among newer faculty members. Degree of involvement with student activities was related more to knowledge about student personnel functions than to length of time in association with the institution.

Several other individual institutional studies (Atwater, 1961; Beckers, 1961; Brantley, 1960; Harry, 1960) yielded data indicating that a major problem for the student personnel administrator was that of communicating the functions and purposes of the specific aspects of the student personnel service program to both faculty and students. In general, faculty members and the professional staff involved in the service programs perceived the goals and purposes of the services as essentially the same. Students, however, seemed to have quite different perceptions of the role of these services and showed considerable ignorance about their functions.

Orientation and Faculty Advising

An orientation course to meet adjustment needs of freshmen was developed by Griffin (1960). Five major problem areas were found: (a) The freshmen did not confer with their instructors or advisers for assistance when such assistance might have been helpful. (b) They had poor study habits. (c) Personal problems interfered with their ability to concentrate. (d) They needed a purpose for being in college. (e) They experienced potential conflict in specifications for study requirements.

Leasure (1961) studied the effects of two experimental orientation groups, one student-centered and one leader-planned, on collegiate adjustment as measured by the *Mooney Problem Check List*, Wrenn's *Study Habits Inventory*, and first semester grade point average. A significant difference in the reduction of indicated problems on the *Mooney Problem Check List* was found between the two experimental groups and the control group, but there was no difference between the two experimental groups. The greatest original concern of all three groups—adjustment to college work—shifted for the two experimental groups but not for the control group, and the total score of the experimental groups improved while that of the control group deteriorated. In terms of college success measured by predicted-achieved ratios, the student-centered excelled the leader-planned group, and both were better than the control group.

Fahrbach (1960) worked with matched samples of students—"previewers," those participating in a two-day summer orientation program, and "nonpreviewers," those not participating. In each male sample more previewers than nonpreviewers joined fraternities. A significantly greater percentage of scholastic dropouts occurred among male liberal arts nonpreviewers. A significantly greater percentage of the female nonpreview group were placed on scholastic probation. A greater percentage of female previewers than nonpreviewers made the honor roll.

Ivey (1963) evaluated three different programs of orientation by means of questionnaire responses of freshmen in mid-October of each of the three years. No sex differences were found, and attitudes remained stable over the three years. Students responded best to social and informational activities.

Tautfest (1961) used a stratified sample of Purdue University freshmen to get reactions to topics and treatment in orientation week. Strong concentrated interests in academic aspects, becoming familiar with campus, handling finances, student organizations, and intramural sports were the topics most preferred.

Smith (1964) used the Bell *Adjustment Inventory* with a freshman class of over 600 Negro students. The most frequent concerns were identified as economic deprivation, health, home problems, and an oversensitive attitude toward people. When these facts were added to data on scholastic aptitude and achievement differentials, they appeared to show the effects of these problem concerns on achievement.

Morehead and Johnson (1964) compared two groups of male electrical engineering freshmen exposed to different faculty advising programs, one consisting of about 40 hours of group meetings and the other of individual conferences. Neither program involved intensive counseling or required special competencies beyond those that faculty normally possess. The group whose advisers used the more systematic approach (experimental) had a significantly higher grade point average in the spring semester, a greater proportion of high achievers, and a lower dropout rate. The control group's dropouts were of higher ability levels.

Extraclass Activities

Reich (1961) surveyed student leader opinions on campus life on 71 campuses in 34 states. She observed that student interest in activities was generally declining. Changes were more apparent on large campuses, while smaller campuses showed less break with traditional patterns. Wide variations in responses indicated that a student's perception of personal value in activities was more controlling than was a response to campus tradition.

In a comparison of university student organization leaders and nonjoiners, tests showed no relationship between values, aptitudes, and beliefs and college participation. However, the student leaders appeared to come from higher socioeconomic and educational backgrounds (Barker, 1962).

Williamson (1960) resurveyed 121 of the 125 colleges and universities of all types and sizes, originally surveyed in 1957, to determine the trend in payment of campus leaders. In general there was a decline from 84 percent of the colleges paying in 1957 to 78 percent paying in 1960. Administrators generally felt that student leadership should be voluntary, as an element in community training, and were concerned that service concepts were being lost. Student leaders felt that the press of time and finances would require them to seek other jobs if payment could not be made for leadership positions in student activities.

Tillman (1961) studied the academic, extracurricular, and noncurricular activities of married and single undergraduate male students. Differences were found favoring the married student in grade point average, outside employment, and self-support. The single student attended more dances and movies, engaged in more individual sports, and spent more time in the student union and visiting friends. In other activities no behavior pattern differences were observed.

Kalish and Bartos (1960) developed an Information Test, a Latent Attitude Test, a Manifest Attitude Test, and a Biographical Information Blank, all of which indicated that interest and information regarding activities were significantly related to the leadership and participation of the students, while scholarship and academic aptitude were found to have only a marginal relationship. O'Donovan and Leila (1964) found no significant relationship between involvement in nonacademic activities and academic achievement of junior and senior business majors.

Roskens (1960) reported a postcollege questionnaire follow-up on activities of University of Iowa graduates from 1922 to 1953. Substantial correlations were obtained between college and postcollege participation and leadership.

Bloland and Hall (1962) developed and tested a method for analyzing and projecting space and facility needs for support of various student activities by virtue of student involvement and the focus of the institution on activities as integral to the total educational program.

Kirkbride (1961) surveyed 153 selected coeducational institutions to investigate the status of 12 types of group approach in 11 different student personnel service functions. Group methods were used as adjuncts to individual contact rather than as substitutes for it. They were used more often in large schools than in small ones, in private institutions more than in public, and with female students more than with male students. The three methods most often used—group discussion, group conference, and orientation courses—were used primarily in the orientation of new students, at central counseling centers, and in the supervision of student activities.

Fraternities

From 1950 to 1960, fraternity membership at the University of Minnesota dropped from 12 to 8 percent of the available potential for membership, despite marked growth in the student body. Bacig and Sgan (1962) offered several testable hypotheses to explain the decline: changing times and attitudes toward education; racial and religious discrimination; exertion of negative influences on members; and continuation of pledging and initiation rituals which alienate members from the rest of the campus culture.

Trumpe (1962) developed an instrument for evaluating college social fraternities with the help of 253 college deans on campuses where fraternities existed, national officers of 33 different fraternities, and 143 fraternity chapter presidents. Psychophysical in nature, it correlated 0.458 and 0.485, respectively, with rankings made by members of the interfraternity council and panhellenic board based on scholarship, campus leadership, intramural activities, and their personal concepts of what constitutes a well rounded fraternity.

Matson (1963) studied the effects of place of residence upon academic achievement. The 30 fraternities at Indiana University were divided by the ratings of judges into three categories—high prestige, middle prestige, and low prestige—and were compared with dormitories and off-campus housing. A relationship existed between fraternity prestige and academic achievement, although this was partly due to the higher ability of members. [Crookston (1961) noted differences on the prestige axis resulting from selection of pledges and their treatment.] The average abilities of the five groups grew increasingly similar toward the senior year as the poor-ability students of the low prestige fraternity group and the off-campus group were weeded out. Fraternities with an average or better reputation and the residence hall environment seemed to produce the best atmosphere for academic achievement, whereas off-campus living and fraternities with low prestige seemed to have a negative effect. [Buckner (1961), Crookston (1960), and Prusok and Walsh (1964) found no differences in freshman-year grades by place of residence.] The dropout rate was higher for the off-campus group and the residence hall group than for any of the fraternity groups. In a different setting, Willingham (1962) reported a similar finding.

Religious Activities

A number of articles have appeared during the past five years describing religious activities programs in higher education. Harrod (1960) and Carey (1962) found that in tax-supported institutions controls are placed under the dean of students, while in private institutions there are a number of other arrangements. In general, the tax-supported institutions provided more regulation of religious groups than did others. Despite the fact that tax-supported institutions noted legal restrictions preventing overt budgetary supports, in common with other types of institutions they provided meeting places and other support that effectively recognized the place of such programs on the campus. Over 97 percent of the interdenominational schools reported formal courses in religious education; slightly more than 50 percent of tax-supported schools reported such courses.

Ferman (1961) reported negligible impact of the college experience in changing religious values. He concluded that most students made fairly permanent decisions regarding their religious values before entering college.

Housing

Rork and D'Amico (1962) reported that most U.S. universities, teachers colleges, and liberal arts colleges now provide some housing facilities. Most public junior colleges do not provide housing. Married students are increasing in numbers on campus [Mueller (1960) reported a rise from 21 percent in 1955 to an anticipated 25 percent in 1965], and they require approximately two and one-half times more living space than do single students.

Crane (1962) reported responses from 39 colleges and universities of 2,000 to 8,000 students which yielded a normative pattern on the characteristics of residence halls.

The living-learning system at Michigan State University, where classrooms and faculty offices are housed within the coeducational dormitory complex, was described by Olson (1964a, b). Eighty percent of the faculty involved made favorable comments about the overall plan, including the coeducational residential hall itself, the class-scheduling system, the increased discussion on the part of students both in and out of the classroom, increased visits to offices of instructors and advisers, a more informal relationship with students, and better *esprit de corps*. A related study indicated strong satisfaction of students with the living-learning type of residence. Special satisfaction with social aspects and increased contact with instructors were noted.

The ratio of counselors to freshman men in the residence halls of Cornell University appeared to have little effect on grade averages or scores on the Brown-Holtzman Survey of Study Habits and Attitudes (Irvin, 1962). However, when the number of counselors was greater, students presented them with more personal and psychological problems.

Sander (1964) studied the effectiveness of using student advisers in individual and group procedures with freshmen in residence halls. Using the criteria of grade point average, perseverance in college, and change in accuracy of self-perception, no significant differences were found between the two treatment groups employing individual and group counseling and the control group receiving no special treatment.

Murray (1960) found that grades of freshman roommates are likely to deviate from expectancy in the same direction, and grades of students sharing rooms deviate from expectancy to a greater degree than do grades of students living alone. The overall influence of roommates tended to be more often negative than positive.

Marquardt (1961) found resident advisers to have the most professional expectations of their role, followed by resident assistants, with the least professional expectations being held by the students.

Koile and Hays (1962) analyzed critical incidents of head resident behavior reported by students as retarding or enhancing emotional maturity. Enhancing incidents met Rogers' three basic conditions for psychological growth: unconditional positive regard, empathic understanding, and congruence. The use of these incidents was proposed for inservice training programs to assist in understanding student behavior and in fostering student development.

A special training program in study habits and skills for graduate students serving as residence hall counselors made little change in each counselor's perception of his adequacy but improved public relations with students (Hood, 1962).

Horle and Gazda (1963) gave to men's residence-hall counselors in a wide variety of schools a broad definition of counseling to use as a model in determining whether their activities could be so classified. They found that much so-called counseling was being done by untrained individuals without relevant educational background and experience. The residence hall position was primarily being used to finance further education, usually not in counseling and guidance.

To study differential perceptions of the role of the student dormitory counselor, Gonyea and Warman (1962) devised the Counselor Perception Blank and Counseling Appropriateness Check List as instruments for selection of student counselors. The instruments were validated on experienced counselors and then applied to groups including administrators, inexperienced counselors, and dormitory residents. The ideal student counselor was characterized primarily by needs for nurturance and intraception (need to understand people), to a lesser degree by dominance and achievement, and least of all by autonomy and exhibitionism. Administrators and head residents held perceptions of counselor functions that differed markedly from those of the dormitory residents.

Sheldon (1962) reported an evaluation in the sixth year of a University of Illinois program to prepare a small group of mature women for student personnel work in residence halls. It was concluded that the program proved to be a source of adequately trained and qualified staff. They developed good counseling, group advising, and program development skills. In some ways they were better accepted by students than by the young staff.

Although a number of larger colleges and universities have replaced housemothers in dormitories with guidance personnel, Otto (1961) considered housemothers to be a neglected resource. A three-year five-institution study, which included interviews and group discussions with students and conferences with administrators and housemothers, led to the conclusion that the housemother, because of daily and continuous contact with the student, has a key position influencing student emotional health, attitude, and adjustment toward college and determines the atmosphere in the campus residence which, in turn, can affect the morale of the whole institution.

As a selection procedure, Sheeder (1963) used staff in various roles to create life situations in which applicants for counseling positions had to operate. Applicants generally expressed approval of the method as being fairer and more objective than the usual interview methods.

A descriptive study by Ruthenberg (1961), showing differences in staff perceptions of rules, regulations, policies, and procedures in the residence halls of the University of Denver, indicated that staff and student officers in the halls did not know the majority of these rules, that there was a difference between the administrative desire and the real implementation of the rules by the staff and student officers, and that staff and student officers perceive these rules differently among themselves.

Prusok (1960) surveyed freshman men and women living off campus at the State University of Iowa. Finances were the primary reason for selecting off-campus housing, with a desire for independence next. These students tended to participate in student activities less and to use university special services less, seeking help instead from other students, instructors, and faculty advisers. A significant communication barrier existed between the off-campus student and the institution.

Gross (1961) studied 273 students at 43 colleges who worked in private homes for room and board, predominantly freshman women 18 or 19 years of age. The turnover rate after one year was 50 percent, with a change-of-homes rate of 20 percent, although few students left college. The work expectations of students and householders were not clearly defined, and the householders failed to arrange home routines. Student personnel workers involved noted that they were able to detect students with problems earlier than in other housing arrangements. Housing conditions were superior to rooming houses; but social development with the peer group was hindered, and time commitments limited study efficiency and educational development. Adjustment to college was generally hindered.

Surveying the limited amount of research on foreign-student housing, McCullough and Mestenhauser (1963) concluded that educational potentials in the residence experience have not been utilized. Porter (1962) devised a new instrument for inventorying the problems of foreign students. The inventory differentiates between the problems of foreign students and American students and can be used to help foreign students and to devise programs to meet their needs.

Financial Aid, Employment, and Placement

Thistlethwaite (1959) studied the influence of scholarships upon the college-going behavior of talented students and identified some student characteristics which modulate the impact of scholarships. A sample of National Merit Scholarship winners was matched with a sample of near winners who received no aid on the basis of sex, total *Scholastic Aptitude Test* score, percentile rank in high school graduating class, and available family resources. The immediate effects of the award were increased attendance at college of first choice, colleges with small freshman classes, privately controlled colleges, and colleges with religious affiliation. Large stipends tended to influence attendance at high-cost schools and all-male or all-female schools, to promote more advanced training, and to improve chances of acceptance to colleges with selective admissions.

Wright and Clark (1961) investigated the effects upon extracurricular participation of academic endeavor to meet requirements for renewing scholarships. Students who met scholarship-renewing requirements belonged to a greater number of well defined student organizations. Those failing to win renewal of their scholarships participated in a greater number of activities of "outside" organizations.

Harrington (1964) evaluated an emergency student loan program. Although there was no correlation between grade point average and repayment experience, active participation in extracurricular activities in high school and college accompanied prompt repayment patterns. Personal interviews at the time of the loan and mailed reminders increased repayment rates. That students have a greater capacity for meeting financial needs than is supposed was indicated by the number who obtained funds from other sources when refused by the institution.

Adams (1962) developed a system of classifying by title, code, and description the on-campus part-time jobs performed by college students, with the primary purpose of attempting to determine their educational value. The analysis was done on jobs of 2,088 students based on 166 job descriptions, 16 occupational groups, and 5 major occupational divisions, with the educational progress of the student paralleling the complexity of the job.

In 1962 nearly three fourths of all college degrees awarded indicated that half a million employment candidates were serviced by college placement offices. Small colleges were found to have better success in getting early placement for their graduates than large colleges, and as many or more of their graduates continued for graduate work (Brooks, 1964).

Stevens (1963) classified student clients as (a) ready to be placed in a specific job in a specific geographic area, (b) not ready to be placed, or (c) showing no conclusive evidence of readiness or unreadiness. From interviews she derived several promising new instruments: a Placement Readiness Scale, an Over-all Impression Readiness Rating Scale, and a Placement Prediction Scale. A Placement Success Scale was used as a criterion measurement. Using as subjects 100 New York University Placement Service registrants seeking jobs in education, she found the Placement Readiness Scale to be more effective in predicting outcome than was a counselor's intuitive judgment, and success in job placement appeared to be associated with the level of placement readiness.

Brown (1961) utilized case studies to assess the practices of 100 student personnel officers at as many schools with regard to revealing student record information to prospective employers. The wide discrepancies suggested the need for development of policy guidelines governing use of such records.

About 78 percent of placement directors in a sample of 184 schools opposed special fees for this college service (Eckberg, 1963). Of those in favor of fees, 78 percent represented private schools. Of the 184 schools, 39, or 21 percent, actually charged fees. Of these, 11 favored dropping them.

Health Services

Students who were frequent visitors to the infirmary, in contrast to those who made average or small use of the infirmary, were found by the *Minnesota Multiphasic Personality Inventory*, the Leary *Interpersonal Check List*, the Jourard Self-Disclosure Questionnaire, and a personal data form to be individuals who had poor control over acting out their feelings, were immature in self-development and in development of interpersonal relations, manifested hostile-dependent conflicts in relation to their parents, and described homes as places of discord and strife (Wharton, 1962).

Kirk (1964) developed an instrument to evaluate college and university health service programs. Forty-eight health service directors placed 247 discrete items into 31 categories, with each category assigned 100 possible points for a total of 3,100 points. Tried by 13 institutions, the instrument was found to be valid, reliable, and suitable for evaluating any college or university health service, either by its own director or by a competent outside examiner.

Whittington (1961) noted that only one half of all colleges have any organized mental health program and only 14 percent have facilities including a psychiatrist or psychologist in the student health service. Cowen (1960) surveyed the activities and functions of psychologists in university mental health programs. A questionnaire was returned by all but two of the 52 institutions having a doctoral program in clinical psychology approved by the American Psychological Association. All had facilities available to undergraduates, and all but one allowed graduate student usage as well. Four types of facilities were found: psychological with a minimum of psychiatric participation in 18 institutions; psychiatric with a minimum of psychological participation in 5 institutions; separate and independent psychological and psychiatric facilities in 22 institutions; and integrated facilities with joint staff participation in 5 institutions. Psychotherapy was offered by 46 colleges and universities, 18 of which also provided group therapy. Four institutions charged fees; 34 provided free services. The remaining 12 charged according to the nature and extent of each case.

Discipline

The need for long-range follow-up evaluations of counseling-oriented discipline still exists.

Prusok (1961, 1963) investigated the attitudes of students, parents of students, and student personnel workers toward 76 university disciplinary situations. He found student personnel workers most punitive in their attitudes, parents next, and students least punitive. Inasmuch as the focus of the study was only on punitive action, there was a built-in bias in attitudes. An evaluation of student mores by Hodinko (1964) revealed that high-ranking offenses in the eyes of undergraduate students were theft for material value, cheating involving collusion, and sexual promiscuity. Low-ranking offenses were theft for novelty value, possession of beer on campus, and drinking by a minor. He observed that men were more critical of acts involving cheating, property destruction, or theft than were women and were more approving of misuse of alcoholic beverages and sexual promiscuity. Older students took a more serious view of prankish behavior, and fraternity men generally expressed milder censure in all categories than did independent students. Sorority women, however, reacted with more strictness in all categories than did independent women.

Sillers and Feder (1964) used a measuring device which permitted inference of attitudes from personal evaluations of factual situations and followed up with interviews to appraise the attitudes of college presidents, academic deans, and student personnel deans in nine public institutions of higher education toward disciplinary problems. Extensive data concerning each student case were supplied. In general, the data were used more on a *post hoc* basis for justification of attitude and action than for understanding the individual. A unique point of view was not found among the student personnel workers. There was more similarity of attitude among individuals within a given institution than among individuals of a given professional type in the several institutions.

Research and Evaluation Functions

Commenting on the lack of available knowledge, Williamson (1964) noted that much contemporary student personnel work is not grounded in basic research. The built-in improvement of practice and technique through continuing research on basic processes must be accompanied by more research on the basic phenomena of the college adolescent and his full development with intensified research on the institutional settings in which such development takes place.

Robinson and Brown (1961) found 77 studies focused on students and student personnel programs being conducted by 13 agencies and centers for the study of higher education. Of highest frequency were studies of student characteristics, attendance, retention and withdrawal of college students, and student personnel programs. Berrian (1962) examined the *Education Index* for the years 1910 through 1959 for research articles on student personnel work in higher education. She noted a gradual increase in the number of articles, a slight increase in each decade in the proportion of pages on student personnel work, and the greatest concern of writers for educational adjustment, college personnel programs, tests and measurements, and adjustment factors. More articles dealt with selection for admission and counseling than with other services. Descriptive research was most frequent, and psychological tests and questionnaires were the most used research tools. In the last decade much more attention was paid to sampling methods and statistical procedures.

Fisher and Roth (1961) pointed out major restrictions and limitations of current research in the field: single factors are most often investigated; single instruments are used; and single dimensions are measured. They noted an absence of postulates and hypothetical systems in many research programs and stressed the interdependent functions and criteria of adequacy as the other two aspects of adequate research structure. They suggested a pattern for the complex research methodology required by the complex operations of educational functions.

Crookston and Blaesser (1962) analyzed some of the major changes in various aspects of college life which seem to be continuing to change. They proposed force-field analysis for the study of the structure and process of change, presented diagrams of situations illustrating the driving and restraining forces operating against the quasi-stationary equilibrium, and proposed a research and an operating structure for the systematic and experimental study of change.

Williamson (1961) offered a number of testable hypotheses concerning the possibility of new constructions in student relationships with the student personnel staff as well as with other agencies within an institution in the area of student expression on social issues.

In the significant theoretical articles of the period being reviewed, there is a strong thrust toward more basic research and a structuring of research designs which will take account of the complex variables operating in the college student's life. With these improved approaches there is concomitant development of studies of systems, their operational effectiveness, and their differential end products.

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CHAPTER VII

Professional Education

STEPHEN ABRAHAMSON

This separate section treating education for the professions has been included in the REVIEW largely because of the sharp increase in research activity. Unfortunately, the very term *profession* can include different occupations depending on the definition given it. Blauch (1960) included "those forms of specialized education for which schools or colleges are maintained in the university." Limiting the field further for the present chapter to include only education for medicine, dentistry, nursing, law, social work, and engineering, the author still reviewed more than 400 separate research reports.

Since research for the most part is in single fields of professional education, a simple approach to organization would be grouping according to profession. However, treating common topics *across* profession lines affords a better opportunity to synthesize and present the common elements and problems of education for the professions. Thus, this chapter includes sections on students, curriculum development, techniques and materials of instruction, and faculty.

Students

Studies in the six professional education areas included in this chapter tend to fall into three major categories: prediction of success in the professional school, characteristics of students in the school, and follow-up of graduates and dropouts.

Prediction

In almost all studies professional school course grades were used as criteria for success. The prediction variables included aptitude tests, general intelligence measures, preprofessional academic achievement, and psychological traits. Some studies attempted to find the best single or multiple predictor. Schumacher (1963) attempted to present "a relatively simple, unweighted formula for predicting success in medical school." He found the usual variables related to professional school achievement: age, undergraduate grades, and personal qualities noted in the interview. Academic ability tended to be less important in clinical studies (i.e., student activities associated with direct experience in the profession). Gough (1963), using Pearson correlations, compared premedical college grades and scores on the *Medical College Admissions Test (MCAT)* with medical school grade point averages and found many statistically significant coefficients. However, the highest were less than 0.5 and tended to be descriptive of the relationship between college science grades and first-year medical school grades and between scores on the *MCAT* science subtest and first-year medical school grades. Correlations decreased in magnitude and significance when the criterion variables were used later as measures of achievement. Hood (1963) included 22 variables and found predental school academic grades the best single predictor. When he combined predictors, the best multiple coefficient was 0.70. Concern with potential errors in screening was voiced by Willingham (1964), who found that although freshman chemistry and mathematics grades were the best indicators of subsequent success in technical curricula, the relationship was "moderate at best." Similar concern could be voiced by others, since correlations tend to be low although significant. Derevere (1961) found correlations between 0.26 and 0.39 when "chalk carving" and "object visualization" were compared with first-year and fourth-year grades in operative dentistry. Johnson (1962) also found low correlations (highest was 0.28) between selected admissions data and cumulative achievement grades in medical school and concluded that cutoff scores hold more promise than correlations as admissions criteria and that a multiple cutoff approach is better than an individual approach. Buehler and Trainer (1962) also expressed doubt, saying that "good premedical students are good medical students," but pointing out also that 20 percent of the poorer premedical students graduated in the top half of their respective classes and 10 percent of the better premedical students graduated in the bottom half.

Nonintellective factors were also studied. Meile (1962) found personal adjustment of first-year law students to be independent of their grades, but he was able to conclude that the later a student decided to enter law, the harder it was for him to adjust to law school. This seems to contradict another generalization of his: the stronger a student's desire to become a lawyer, the higher his grades but the poorer his adjustment. Eichhorn and Kallas (1962) found a significant relationship, using chi square, when they studied dropping out of engineering school and such factors as mother's education, siblings' education, financing from parents, and fraternity membership. Finally, Martin (1962) found success and failure in nursing school significantly related to scores on achievement and intelligence tests.

Student Characteristics

During the five years under review, two major studies of medical students were published. Becker and others (1961) presented a thorough and insightful sociological study of University of Kansas medical students, describing major changes in the students during a four-year program. Horowitz (1964) provided documentation of the educational gains from curriculum revision at the Western Reserve University School of Medicine with his 20 interesting, informative, and competently done case studies of students in that program.

Literature in professional education includes many studies of student attitudes. Despite the usual problems of attitude measurement, many investigators managed to use existing scales or to construct their own. Rosinski (1963) surveyed medical student attitudes with a specially designed card-sort attitude scale and discovered positive changes in attitude toward medicine over the four years of medical school but significantly negative changes toward education and research. Stiff and Phipps (1964) tested attitudes of dental students toward chronically ill, aged, and disabled persons, using two scales: favorable change in attitudes before and after clinical dental experience. Varley (1963) described social work values of beginning and graduating students on four scales of high reliability: equal rights, service, psychodynamic-mindedness, and universalism. She found no differences when both *t*-test and analysis of variance were used.

Levitt, Lubin, and Zuckerman (1962) administered the *Edwards Personal Preference Schedule* to 1,000 women including 212 student nurses and 167 graduate nurses. They found an increase in social feminine need as the college woman became a student nurse. As the student nurse became a graduate nurse, there was an accompanying decrease in nurturance and an increase in deference, order, and endurance.

Enrollment in Professional Schools

Enrollment trends in engineering education were described by Kriegel (1963), who concluded that the number of advanced-degree candidates has been rapidly rising, and that while the demand for advanced-degree engineers is expected to continue, it seems quite dependent upon the federal government's attitude. Social work enrollment trends were explored by Pins (1963) in a very thorough survey in which he obtained 2,900 responses to 2,964 questionnaires administered to full-time first-year students in the fall of 1960, and by Ross and Lichtenberg (1963), who reviewed the period from 1950 to 1960. Annual reviews of medical school enrollment figures appeared in the *Journal of Medical Education* (Johnson, 1964; Hutchins, 1963a, b; and Hutchins and Gee, 1961, 1962).

Follow-Up Studies

Stewart and Pennell (1961) conducted a survey of all U.S. medical school graduates living in 1959, examining such things as the number of graduates per school, the number in private practice, the number of full-time specialists, and the physicians' locations. Schumacher (1964) attempted to analyze choice of medical specialty according to marital status, medical school attended, size of city in which the graduates grew up, scholastic aptitude, certain values, and certain personality traits. Bristol (1962) asked graduating seniors in engineering to complete a questionnaire giving reasons for job acceptance. The five reasons given most frequently were type of work involved, location, salary, opportunities for advancement, and opportunities for advanced-degree study.

Dropouts are a serious and costly problem in professional education. Larsen (1962) studied students in the general nursing program at the University of Buffalo and found that discouraging factors include costs, credits required for the degree, the five-year time limit, and the field experience requirement. Kibrick (1963) found the following factors related to dropping out: incomplete knowledge of the program, resentment of authority and routine, high independence, ambivalence, and managerial home background.

Curriculum Development

Literature on professional education abounds with discussions of scope and sequence, essential content, and experimental programs. Research, however, is limited generally to reports of curriculum revision. Medical education has been characterized since World War II by large-scale curriculum changes in some institutions. These are reviewed precisely and thoroughly by Lee (1962), who describes nine "experiments." The most notable of these is that of Western Reserve University, reported on by Ham (1962).

Experimental Courses

The kinds of courses reported on do not lend themselves to true synthesis since each is in a special area of professional preparation. Many are worthy of note by virtue of research design or simply because their mention provides a true picture of the kind of experimentation taking place. These range from course experimentation with no attempt at precise evaluation to experimentation with the use of fairly sophisticated evaluation techniques. Miles and Parker (1962) reported on an experimental project in Great Books education for engineering students and reported a "feeling" that the course provides broad background in an important area. Elmer (1962), reporting on experimental field placement of social work students, provided no data but concluded that "students . . . evidenced heightened knowledge of . . . principles."

With a reasonable research design involving five 10-student groups (two separate discussion groups, two separate discussion groups with clinical experience, and one group using the "current method"), Schield

(1962) explored the "merits of an experimental course in dental technics" and reported a significant (p=0.06) advantage to the discussion-and-clinic experience. Shatin and Nenno (1963) used a questionnaire to evaluate Seton Hall's new 68-hour teaching program for first-year medical students, while Aldrich and Bernhardt (1963) used a "problems cases test," consisting of seven vignettes and open-ended questions, in assessing the worth of a new program in teaching psychiatry to medical students. Results showed no significant advantage of the newer course. Hand (1964) studied progress in technical writing for engineering students and concluded that the most important areas of growth were brought about by practice. Finally, Hayes and Swenson (1963), in a reasonably well-designed research study of the effects of a three-month educational experience in psychiatric nursing, found no change in adjustment scores or in self-concept.

General Surveys

Nelson (1960) investigated trends in nursing curriculum change through a questionnaire to 30 schools of nursing and found the major trend "a process of integration which places the material in the static framework" of specialty nursing care. *Nursing Outlook* (1961) reported a survey of 381 diploma programs in the North Atlantic region and compared accredited schools with nonaccredited schools.

Rosinski and Blanton (1962) attempted to list, categorize, and store on data-processing cards the entire content of a medical school curriculum. They had each department of the Medical College of Virginia report its content, the educational objectives involved in each "bit" (i.e., information, understanding, attitudes, skills), and the instructional techniques employed. Through this approach they were able to identify blind duplications of subject matter coverage.

Course Content

Literature on professional education has been concerned with what *is* taught and what *should be* taught in specific familiar courses. Tager (1964) surveyed the specific lecture content of 32 microbiology departments in U.S. medical schools. Neidle and Hampel (1963), after return of a rather lengthy questionnaire from 40 of 53 schools contacted, cataloged the instruments used in laboratory instruction, the visual aids employed, and the problems encountered in teaching physiology in dental schools. Budowsky and others (1961) used a questionnaire to study methods of teaching oral roentgenology in dental schools. They received responses from 36 schools but made no mention of what the percentage response was. South (1961) reported on a survey of tuberculosis education in 1,099 schools of nursing but did not give percentage responses either. Such surveys can be quite useful to educators involved in curriculum planning and should not therefore be disparaged, despite the resultant lists or tabulations of practice that often seem to provide no insights or hypotheses for professional education.

Techniques and Materials of Instruction

Those who are trying for the first time to seek answers to problems in education often follow a developmental pattern of research. It is not unusual to find an early preoccupation with the effectiveness of familiar instruction techniques, particularly the lecture, small-group discussion, demonstration, and laboratory. In general, when these studies are designed well and the tests are rigorous, results tend to show no difference or a slight edge to the less formal of the techniques under study.

Netsky, Banghart, and Hain (1964) found no significant differences when they divided 74 students into two groups (alphabetically) and treated one with seven lectures and a two-hour laboratory session after each and the other with seven one-hour seminars and a two-hour laboratory session after each. The alphabetical distribution into two groups resulted in no group differences in class rank or in scores on the *MCAT*. Performance on an achievement test was the criterion. Zimmerman and King (1963), on the other hand, showed significantly greater cognitive gain in student-centered discussion groups as compared to lectures.

Rising (1961) reported on the evaluation of the use of low-cost motion pictures as instructional tools for a computation laboratory course in engineering. He found that students learned both conceptual and factual material as well from the films as from lectures. He decided that the film offered great advantage, therefore, to the less-experienced teacher.

A more sophisticated study using a fine research design was reported by Ginther (1963), who also used analysis of covariance in his study of an experimental method of teaching hematology in 13 schools. Ginther stated that "results tend to establish method as an important main effect" and "the amount of time scheduled . . . was an important main effect."

A study by Higdon, Erdle, and Quanbeck (1962) tested the effect of scheduling study time for students with teachers present. Two 96-student groups were matched for academic averages and abilities. The experimental treatment consisted of class study periods with an instructor present and no homework; the control group studied on their own. The authors reported no significant differences in achievement and suggested that supervised study is not educationally beneficial.

Testing and Grading

The studies reported show the range of investigators' interests. Since education for the professions involves achievement of skills, acquisition of knowledge, development of attitudes, and synthesis of these into an integrated performance, scholars in this field tend to be concerned with the design of new techniques and the testing of old.

Boyle (1964) attempted to validate short-answer achievement tests in engineering. He explained a method for computing index values for determination of advantages and disadvantages of short-answer tests. Abrahamson (1964) described a routine test of interrater reliability in which five pairs of instructors were required to read and grade essay examination questions. The readers disagreed as often as they agreed about whether the student's response contained the essential material, whether the student displayed an adequate understanding, and just how good the total response was.

Medical education, perhaps more than any other professional education, seems to have been concerned with measurement of clinical performance. Liske, Ort, and Ford (1964) reported the development of a clinical performance rating scale in which there was only limited interrater agreement. Cline (1961) described the development of a film-and-test technique. He presented tests of the relationships between performance on a test accompanying a sound film, grades in internal medicine, and *MCAT* scores. The highest single correlation found was 0.32 between scores in the first film test and *MCAT* science subtest scores. The development of tests of diagnostic skills was summarized by Rimoldi (1961).

Balabanian (1964) reported on an experiment to reduce tensions resulting from grading by introducing a contract system between student and teacher. He concluded that such contract assignments (of varying amounts for A, B, and C grades) may be a good substitute for traditional grading practices. Palmer (1962), also looking at grading, had nursing students perform an anecdotal self-evaluation, applying the same criteria as the instructors. After a two-year test with two classes, Palmer concluded that self-evaluation was reliable, bringing personal satisfaction and self-insight to students. An incidental benefit was the development of more trust between teachers and students.

Programed Instruction

Research tended to show a slightly greater informational gain with the use of programed materials. None of the research discussed cost, and almost none concerned retention, both of which need investigation.

Using a good experimental design, Green, Weiss, and Nice (1962) tested the use of a programed text in a medical school course. The results favored programed instruction; interestingly enough, greater efficiency was found for all students, experimental and control alike. Cheris and Cheris (1964) indicated superiority of programed instruction for 46 third-year students whom they divided into two groups, matched according to grade point average, for teaching radiology in a medical school. They also reported, however, that "more efficient learning results from a text presentation."

Harrison (1963) tested programed instruction in dental education but did not report the use of any statistical test of significance. He concluded that "*self-instructional exercises* are slightly more *effective* than 'traditional presentation.'" Kelso (1961) showed the advantage of programing in law school. He divided 53 third-year law students into experimental and control groups, giving the former 82 pages of "immediate response" program instead of classes. He mentioned no test of significance but did report the two means.

The popular interest in programed instruction is demonstrated in the way some results are reported. Craytor and Lysaught (1964) divided 81 nursing students into an experimental group using a Skinner-type program of 221 small steps and a control group with "normal class presentation." They reported that students "learned as well by programed methods as by normal instruction." O'Brien and Ryge (1963) used programed learning with dental hygiene students, and while they reported no difference between treatments, they did state that "programed instruction is as effective as the lecture."

Use of Television

Research into the use of television in professional education generally reveals "no difference" after experiment. There were some surveys of the extent of television use. Romano (1964) asked all 48 dental schools whether they were using television in some form and followed up his survey by visiting 20 schools that were using television; he described each in detail.

Grossman, Ship, and Romano (1961) reported on a three-year study in which the third-year class was divided randomly each year into four groups for experimental purposes: in one group, seven or eight students were at the patient's chair; in another, 30 students were in the studio, either at the chair or watching a television monitor; in a third, 30 students were in a lecture room with two screens where there was limited communication; the fourth treatment included no demonstration. No differences were noted. Grant and others (1962), using a good research design, divided a sophomore class in dentistry into four groups: in one, students watched television monitors and were tested immediately; in another, students watched monitors and were tested two days later; in the third group, lectures and slides were followed by immediate testing; and in the fourth, lectures and slides were followed by testing two days later. There were no differences in achievement between the groups using television and those using lectures and slides.

Staub and Merrill (1963) found no differences in scientific reasoning between a group who watched a television demonstration of laboratory work and another group who performed in the laboratory. Westley and

Hornback (1964) found no significant differences in a study involving 56 student nurses. The experimental group received videotaped lessons in three basic nursing units of instruction, and the control group used "normal classroom procedures." A difference was noted in a study by Lancaster and Erskine (1962) which involved 1,332 freshman engineering students divided randomly into three categories: one for small-group instruction in groups ranging from 15 to 22, a second for large-group classes ranging from 58 to 67, and a third for televised instruction for groups of 102 to 108. The large groups did significantly better in analytic geometry than the other two treatment groups, while the television groups did better—but not significantly better—than the small groups.

Faculty

In medical education, more than in other areas of professional education, there has been an increase in research on improvement of teaching. One major impetus was the University of Buffalo Project in Medical Education, which began with a test of the hypothesis that medical school teachers might profit from seminars in education (Abrahamson, 1960). The Project then tested the hypothesis that intensive summer workshops might improve instruction, primarily through a change in attitudes (Rosinski and Miller, 1962b). Faculty teaching practices and attitudes were studied in seven different medical schools. Jason (1962) designed a series of rating scales with a high interrater reliability and observed teaching practices in seven medical schools, using teams of six observers in each—three medical educators and three educationists. An accompanying study reported by Rosinski and Miller (1962a) tested faculty attitudes in the same seven medical schools with a series of attitude scales developed by Rosinski.

Summary

Finding the research in professional education was an arduous task because of the diversity of sources and the quantity of material to be covered. Perhaps more difficult was the task of choosing studies to be included. The research is increasing astonishingly in quantity and quite steadily in quality as educational research expertise is drawn into the area of investigation.

Research tends to be descriptive, except for that on instructional techniques and materials in which experimental investigation is under way. What is needed is further development of cooperative effort or at least common adherence to guidelines which will help yield comparable data. Obviously, a theoretical framework is not available; its beginning would be a major contribution to research effort.

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CHAPTER VIII

Organization and Administration, Finance and Facilities

JAMES I. DOI

Prior to 1960, research on college and university organization meant the identification and analysis of the formal structural aspects of an institution. A convenient way to depict organization was to draw a chart showing the various administrative officers, academic divisions, and departments. The same chart could show line and staff relationships, spans of control, official channels of communication, and formal patterns of subordinance, superordinance, and coordinance. Research on administration focused on the duties and responsibilities of officers, on administrative policies and practices, and on a wide array of problems under such headings as the governing board, student government, and faculty-administrative relationships.

Such research often succeeded in identifying common practices and led to the formulation of principles of organization and administration and recommendations on policies and practices. These principles, recommendations, and information on common practices did much to shape institutions of higher education as we know them today. They served and continue to serve as working tools for the administrator.

The study by Ayers and Russel (1962) dealing with the internal structure of colleges and universities is typical of this traditional research. The basic data were drawn from the current organization charts of 608 institutions. The major limitations of this study, which the authors recognized, are the same as those of similar studies that preceded it: it assumes that position title and list of duties accurately describe what an officer actually does; it assumes that the patterns of communication and relationships depicted by an organization chart are the actual patterns by which the members of the institution relate; and it contributes to an oversimplified, misleading view of the nature of authority and decision making in an academic organization.

In recent years, especially since 1960, the term *organization* has come to take on different connotations in research literature on higher education, and the focuses of research on administration also have changed. The differences in both instances support the observation that a new era of research on the organization and administration of higher education is in the making. The salient features of this new era, at least in this early stage, appear to be the following:

1. Interest in the applicability of theories of formal organization to higher education institutions and in the development of a theory of college organization,
2. Interest in both the formal and informal aspects of college organization,
3. Interest in the application of communication and decision-making theories and models to the governing of colleges and universities,
4. Accelerated diffusion of the terminology and frames of reference of psychology, sociology, political science, public administration, and business administration to include higher education.

To identify publications in the several disciplines that are relevant to research on college organization and administration is beyond the scope of this chapter. However, a few such works will be cited here simply because it is virtually impossible to discuss research on college organization and administration without reference to them. For a comprehensive review, the reader is referred to the October 1964 issue of the REVIEW, in which Lipham (Chapter IV) and Briner and Campbell (Chapter VII) commented on works from the behavioral and political sciences which they regarded as relevant to the study of administrative behavior in educational organizations and to the development of a science of administration.

This chapter will confine its attention primarily to selected works dealing directly with college organization and administration. Many of the works cited are more provocative than empirical, and the empirical are descriptive studies rather than tests of hypotheses derived from or directed toward theory.

Organization

Theory

A distinctive characteristic of a formal organization is that it has been established to achieve a specific goal or set of goals. However, the designation *formal* does not preclude examination of the informal aspects of an organization, for, as noted by Blau and Scott (1962), the formal and informal patterns are inextricably intertwined.

Parsons (1960) suggested a four-category scheme for classifying organizations by function in society: organizations oriented to economic production, organizations oriented to political goals, integrative organizations, and pattern-maintenance organizations. Pattern-maintenance organizations are characterized by either cultural, educational, or expressive functions. Blau and Scott (1962), using prime beneficiary as their criterion, classified formal organizations into mutual-benefit associations, business concerns, service organizations, and commonweal organizations. In this scheme the university is a service organization. Etzioni (1961), using compliance as a comparative base, grouped organizations into those that are predominantly coercive, utilitarian, normative, and those that are dual-structured. Colleges and universities are predominantly normative, in that compliance rests on internalization of directives accepted as legitimate. Leadership, rituals, and manipulation of social and prestige symbols are among the more important techniques of control in normative organizations.

The term *bureaucracy* is invariably used in discussions of formal organizations, and faculty members and editors of student newspapers use the term freely as a synonym for university. Blau and Scott (1962) noted that a formal organization possesses some sort of administrative machinery. In sociology, *bureaucracy* is a term used neutrally to refer to the administrative aspects of an organization. Their definition of bureaucracy is particularly interesting, since it is pertinent to much being written about contemporary college organizations. They defined *bureaucratization* as effort devoted to maintaining the organization rather than to directly achieving its objectives.

Anderson (1963) gave a succinct summary of the major characteristics of *bureaucracy*, *collegiality*, and *community* and speculated on their validity as bases for understanding colleges and universities. Regarding business affairs, student personnel services, and other nonacademic administrative organizations within a university as bureaucratic, he concentrated his observations on the collective faculty. He noted that collegiality is not democracy in administration and suggested a test of the hypothesis that a collegium is inevitably an oligarchy.

In discussing community, Anderson strongly doubted that colleges and universities can be demonstrated to be communities. He differentiated between what they ought to be and what they are and suggested that the concept of community is important in understanding faculty and administrative behavior. Many faculty members are guided by the belief that colleges and universities ought to be communities, and administrators may find it advantageous to operate as if such organizations were communities.

Clark (1961) identified three conflicting concepts of authority in colleges and universities: public trust as represented by a lay governing board, bureaucratic authority as represented by the administration, and colleague authority as represented by the faculty. The latter two he saw as increasing in strength. In a more recent treatise, Clark (1963) pointed to four trends in the social organization of the campus: unitary to composite or federal structure, single to multiple value systems, nonprofessional to professional work, and consensus to bureaucratic coordination. He suggested that the notion of community should be abandoned, since genuine community is no longer with us.

Millett (1962) viewed colleges and universities as organized on the principle not of hierarchy of authority but of community of authority. Power is shared by faculty, students, alumni, and administration; and coordination is achieved through consensus. Millett saw colleges and universities as so different from governmental and business entities that ideas on organization drawn from studies of the latter give no help in understanding the former. Corson (1960), however, maintained that colleges and universities are like other organizations in some important respects though different in others.

Goodman (1962) presented a proposal for a college truly committed to teaching and learning and, as a community of scholars, entirely free of external control, administration, and bureaucratic machinery. A contrasting concept is Kerr's (1963) "multiversity," not one community but many. Presthus (1962) declared that structure and control have overcome spirit and purpose in our universities, and Gross (1963) detected serious disparities between goals and structural arrangements.

Other provocative works with implications for theory and research can be cited, but these should be sufficient to indicate that there does not yet exist a coherent theory of collegiate organization from which researchers might derive hypotheses for investigations. McConnell (1963) noted this lack, and Kimball (1962-63) called for greater research on problems of higher education, particularly on organizational theory.

By way of actual research, Haas and Collen (1963) focused on variations in the degree of formalization of three administrative practices—hiring procedures, evaluation of performance, and handling of unsatisfactory members—in the teaching departments of a large Midwestern university. The variations were analyzed in their relationship to department size, frequency of decision making, department prestige, supply-demand ratio, and humanistic orientation. Entwisle and Walton (1961) made a comparative analysis of the sizes of formal spans of control in colleges and small companies and found them to be similar. Gould and Melbin (1964-65) made a case study of a committee organization created to plan and establish a school of nursing. The authors showed that a major discrepancy existed between the actual organization and a rational model.

Measurement and Description

Descriptions of colleges and universities vary from vignettes, often journalistic in tone, to attempts at more or less comprehensive portrayals, and from those focused on individual schools to those dealing with groups of schools comparable in one or more important characteristics.

Comprehensive portrayals of institutions are seldom made available to the general public in the form of books, except when they are company histories. Clark's (1960) case study of the development of San Jose State College is a significant recent exception. More significant is that it appears to be the only reasonably comprehensive sociological analysis of how various factors affected the evolution of a college organization.

More typical of studies describing college organizations are Mayhew's (1962) work on the liberal arts college, Carlson's (1962) treatise on the municipal university, and Wicke's (1964) book on the church-related college. Each identified the salient features of a particular type or group of institutions and discussed problems common to them. Quantitative data included are usually of the kind gathered by federal and accrediting agencies. In describing church-related colleges, Wicke made effective use of survey data, such as number and credit hours of courses offered, student-faculty ratios, average salaries, proportion of faculty with doctor's degrees, and income and expenditure patterns.

A relatively new development in efforts to describe and measure colleges and universities is the sociopsychological study of campus environment. Literature pertinent to such research is reviewed in Chapter II of this issue.

Barton's (1961) suggested classification of organizational variables and his list of empirical measures of college characteristics may well form the basis for more comprehensive and meaningful descriptive analysis of college organizations. The list includes not only demographic, fiscal, and program data but also data on social structure, attitudes, and role behavior.

Administration

Governance, Decision Making, and Management

The term *administration* is still used in higher education, but its importance is somewhat obscured these days by at least three relatives—governance, decision making, and management. Hungate (1964), for example, declared that the term *management* has broader meaning than *administration* since the latter is sometimes interpreted to exclude policy formation and coordinated planning. For Corson (1960), *governance* is the process or art by which various people associated with a college institution establish and carry out rules and regulations.

Focus on decision making takes the study of college and university administration into a broad field of behavioral science research. Wasserman and Silander (1964) annotated a bibliography on decision making which includes approximately 750 items published between 1958 and 1963. Henderson (1963), in urging research on decision making in colleges and universities, suggested studies involving the use of various theories and concepts of management, leadership, and communication advocated by behavioral scientists and students of public and business administration. Corson (1960), in the course of illuminating various aspects of academic governance, posed and left unanswered enough questions to occupy a generation of researchers.

Contemporary university administration is definitely different from past administration. Rourke and Brooks (1964) called it the "managerial revolution"—the trend toward scientific management illustrated by organized institutional research, increasing use of quantitative data for policy analysis, and use of computers for administrative purposes. Lins (1962) edited a collection of articles devoted to institutional research methods and reports of colleges and universities. The title of the collection suggests that the methods and reports constitute a basis for decisions. With the formalization of the annual National Institutional Research Forum, there was published, under the editorship of Lins (1963), a collection of papers defining the relationship of planning to institutional research; in 1964, under the editorship of Bagley (1964), a set of papers was published representing attempts to establish a conceptual framework for institutional research.

Administrators—Role, Selection, and Training

College and university administrators still remain untouchable as objects for systematic research on role perception and conflict, personality characteristics, value orientation, status-seeking behavior, and identification with institution. Published works about administrators, of which there is no dearth, are mainly anecdotal or advisory. The more extensive statements attempt to cover such matters as style; leadership; duties and responsibilities; relationships with administrative colleagues, faculty, students, governing board, and the public; and selection and training. Dodds (1962) and Prator (1963) focused on the presidency; Corson (1960) and a group of contributors to a book edited by Burns (1962), on a wide array of administrators ranging from the president to departmental chairmen; and Mobberley and Wicke (1962), on the deanship of the liberal arts college.

Bolman (1964) reviewed programs for training administrators, most of which have developed in recent years. He detected two major flaws in current efforts: lack of coordination and lack of evaluation.

The resistance of administrators to serving as subjects for research has sometimes been overcome. Gould (1964), in his study of the academic deanship, succeeded in obtaining completed questionnaires from almost two thirds of a sample of 268 academic deans in the 50 states. In addition he interviewed 12 academic deans from private and public liberal arts colleges and universities. Gould's findings on the dean's relation to others in the institution are significant.

Bolman (1965) tackled the process of selection of college presidents. Questionnaires were sent to 116 presidents of nonparochial four-year colleges and universities who had been appointed to their positions during 1959-62. Confidential interviews were held with more than 100 persons, among them members of governing boards, faculties, alumni, and administrative staffs. The report contains procedural suggestions on such aspects of the selection process as launching the search, the faculty's role, establishing the qualifications, and finding the man. The contents are interesting, but the reader is likely to be left with the distinct impression that much of the data obtained were never transferred from folders marked "confidential" to the printed page.

Systems—Interinstitutional Cooperation and Coordination

Chambers' (1961) study of voluntary statewide coordination in public higher education is both a description of five successful instances of such efforts (in Ohio, Michigan, Indiana, Colorado, and California) and a statement of the point of view that voluntary coordination is more consistent with the nature of the collegiate institution than is statutory (formal) coordination. Since the publication of Chambers' report, however, two of the five states have abandoned voluntary and adopted statutory coordination, and in one other state survival of voluntary coordination is in doubt.

McConnell (1962), in his commentary on a general pattern for public higher education, took the point of view that coordination is inevitable. Anderson (1964) identified more than 80 cooperative programs relating to undergraduate education. The description of each program is very sketchy, but the list is nonetheless informative. Conant (1964) not only approved of statewide and regional coordination but also proposed a 50-state compact for the creation of an interstate commission to plan a nationwide educational policy. Wilson (1964) raised a number of questions concerning form and function of American higher education and declared that resistance to organization and change is no longer tenable. Further observations regarding emerging systems in higher education—state systems and plans, consortia and interinstitutional arrangements, interstate cooperation, and national organizations for higher education—are presented by the American Council on Education (1964).

The effects of the emergence and evolution of these systems on the autonomy and interdependence of colleges and universities have yet to be adequately observed, investigated, or described. There are opportunities here for significant research on the ecology of governance and the dynamics of organizational change.

Pertinent to the foregoing are Eckerman's (1964) study of the public image of state and private universities and Banfield's (1961) study of the politics of the decision to establish a Chicago branch of the University of Illinois. The Eckerman study, a national survey employing a stratified probability sample of 1,310 respondents, indicated that the distinction between state and private universities is a functional one for only a minority of the population.

Finance and Facilities

Research on the finance of higher education currently is focused mainly on costs and productivity measures, budgetary techniques and long-range fiscal planning, development programs and voluntary gifts, and a broad group of questions encompassed by the term "economics of higher education." In the interest of brevity, the ensuing paragraphs will deal with only a small selection of recent studies. The governmental aspects of finance are covered in Chapter IX of this issue of the REVIEW, and J. A. Thomas, in the October 1964 REVIEW, discussed literature pertinent to the economics of higher education. Also in the interest of brevity, the annual, biennial, and serial reports of the U.S. Office of Education, foundations, and associations will generally be excluded.

Current literature on college and university facilities indicates considerable interest in campus planning and the year-round use of plants. Space utilization studies and projections of building needs, which several years ago were considered research, are now so common both in technique and frequency that they are hardly worth mentioning.

Costs and Productivity Measures

Cost is a perennial subject of controversy in higher education. Administrators of public colleges and universities use cost figures cautiously, if at all, and would like to avoid them altogether if the data may possibly be used for determining appropriations. There is considerable justification for both caution and reluctance, since comparability between and among institutions is difficult to attain.

Yet such writers as Harris (1962) and Mushkin and Bokelman (1962) computed cost figures (or per-student expenditures) and used them in commenting on the finance and economics of higher education. The Study Group in the Economics of Education (1964), a group of economists from the United States and a number of European nations, issued a report in which U.S. costs for higher education were compared with the costs of other nations. The focus of these economists is essentially national but on occasion regional. For their purposes, approximately accurate and comparable figures are adequate. For a given university, however, subject to comparison with others in competition for funds, much greater accuracy and comparability are essential. We may expect the ground rules for the computation of costs to be used for budgetary purposes to be quite different from those used by economists concerned with the overall picture. Miller (1964) provided an excellent review of cost analysis procedures for state colleges and universities in California, Florida, Indiana, Kentucky, Texas, and several other states.

Other data of great interest to economists writing on higher education are measures of productivity. Since productivity requires identification and quantification of both input and output, the application of this concept to colleges and universities is controversial. Research to obtain valid measures of productivity for educational institutions can be expected. The impact of productivity measures on the ideology of higher education should also be explored, especially measures generally used by economists.

Long-Range Fiscal Planning

Tickton's (1961) manual for developing a 10-year college budget is a small document that has had tremendous impact on the fiscal behavior of college administrations. It is intended for liberal arts colleges, however, and complex universities attempting long-range fiscal projections have had to deviate from the Tickton format. Hungate and Meeth (1964), in a study of 25 liberal arts colleges, suggested procedures for examining and relating certain facts to cost so that sound qualitative decisions can be made. They noted that long-range planning is often based on inadequate knowledge of quality and of ways to improve it without increasing costs.

Tuition increases are a major concern to private colleges; for most of them, long-range planning requires painful attention to this matter. Harris (1962) and Henderson (1964) are among the writers who have addressed themselves to various aspects of this problem.

Development Programs

Just as major private universities are today public in that they are very dependent upon government grants for support, the stronger state universities are today private in that they seek sizeable gifts and grants from private sources. There is some speculation but as yet no research on what effects, if any, success of such development programs might have on legislative attitudes toward appropriations.

A study of 278 college capital campaigns, published by the Council for Financial Aid to Education (1964a), summarized data on goals and amounts raised by various types of institutions and by geographic areas. There was also an appraisal of short-of-goal campaigns.

The Council for Financial Aid to Education and the American Alumni Council are the two major sponsors of surveys on voluntary support of colleges and universities. The data, however, are difficult to evaluate. One factor is the low rate of return. For example, the latest available survey report of the Council for Financial Aid to Education (1964b) showed that only 53 percent of the 1,948 institutions invited to take part had responded. Another factor is the variation in the number of institutions responding from one survey to the next and in the number responding to the surveys of the two councils.

Venman (1962), in a study of gift annuity agreements for colleges, obtained information from 160 liberal arts colleges having such agreement programs. He concluded that colleges do not use such agreements to their best advantage and that it should not be difficult to establish a safe annuity program if a college understands all aspects of the program.

Year-Round Use of Physical Plant

What had at first seemed like a simple proposal—to accommodate more students in a given plant by adopting a year-round school calendar—has become a subject of much debate and study. No attempt will be made here to unravel the tangled skeins, to separate theory from practice and hope from reality.

An inventory of data on year-round plans at 40 colleges and universities was made by Tickton (1963). Stickler and Carothers (1963) discussed the status, trends, and problems of the year-round calendar, giving special attention to its financial implications. Webb (1963) discussed such systems with reference to Canadian colleges and universities. The problems and prospects of year-round education from kindergarten to college were examined by Schoenfeld and Schmitz (1964).

Campus Planning

The several meanings and many forms of campus planning were identified and evaluated by Dober (1963) in the most comprehensive work to date on campus planning. He illuminated through historical examples the evolution of the campus as a design form, described the factors that make campus planning an important activity, commented on the functional and aesthetic aspects of the physical parts of the campus, and indicated in detail the procedures for preparing campus plans.

Information on what is happening in four major types of campus buildings—classroom, laboratory, library, and dormitory—was brought together and interpreted in a report prepared by the Educational Facilities Laboratories (1964). Riker and Lopez (1961), in their study of college housing, presented a number of interesting tabulations on costs of operating dormitories, space requirement standards, and projections of needs. Zisman and Powell (1962) identified the problems involved in moving a college from an old campus to a new one, basing their observations on a case study of four colleges that undertook such a move.

The space-cost problems of an expanding urban university were discussed by Weinstock (1961) in a report of a case study of Drexel Institute of Technology. Lacy (1962) compiled a collection of papers dealing with the design of community colleges. The design and evaluation of faculty offices were discussed by Carpenter and others (1961).

The University Facilities Research Center examined horizontal and vertical circulation in university buildings (1961a), parking problems for universities (1961b), plumbing fixture requirements in instructional and research buildings (1961c), and research buildings for short-term grant programs (1961d).

Other studies of a similar nature can be cited, but the foregoing should be sufficient to suggest that virtually every aspect of plant facilities is fair game for scrutiny.

Concluding Observations

The organization and administration of colleges and universities are virgin territories for research. They have been explored in the past by reputable scholars and practicing administrators, but within different contexts from those now available. It is in the context of current frames of reference—the theories and concepts developed by the behavioral scientists and students of public and business administration—that the territories are uninvestigated. Exploration may indeed show that colleges and universities are largely or wholly different from other organizations.

The major barrier to the new exploration is the sensitivity, frequently bordering on resistance, of colleges and universities to intensive scrutiny of organizational values, of administrative behavior, and of patterns of authority, influence, and communication.

In the area of finance, colleges and universities are more willing now to make data available than they have been in recent decades. This will greatly aid research on the economics of higher education.

Recent research on physical facilities has paved the way for comprehensive and exciting forms of campus planning.

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CHAPTER IX

Government and Education

C. RUSSELL DE BURLO, JR.

Several great battles have ensued within committees, within committee hearing rooms, and on the floor of Congress over the question of federal aid to education, since the last issue of the REVIEW (October 1960) that dealt with government, administration, coordination, and financing of higher education. Many questions have been raised about the relationship of the federal and state governments to higher education. Answers have been sought to such questions as the following: (a) What have been the effects of the massive appropriations of federal funds upon the institutions of higher learning that have received them? (b) Has the heavy concentration of these funds in scientific research diverted attention and talent from teaching functions? (c) Have these colleges and universities found that federal dollars are followed closely by federal control? (d) What has been the effect on the quality of higher education at the undergraduate and graduate levels? Research on these questions during the past five years has taken the form not of controlled experimentation but of personal points of view, comparative clinical analyses of specific institutions, surveys of quantitative data on existing legislation, analyses or descriptions of events or opinions, and the like.

Most of the literature considered whether the federal government should provide general aid to all higher educational institutions. The answer to such a question, with its broad social implications, hinges largely on the consensus of leaders in the federal government's legislative and executive branches, in colleges and universities, in educational associations, and among the American people at large. Too often, however, such a consensus has not been reached because their points of view focused on different levels or areas of interest.

Significant references found during the period reviewed were concerned mainly with these levels and areas: (a) identification of the responsibilities of federal, state, and local governments for higher education; (b) identification of goals for these complex entities; (c) the composition of the federal government interest and the diversity of higher education: (d) the legislative process; (e) a topical analysis of past and present governmental support to higher education; (f) recommendations or predictions for the future relationship of institutions of higher learning to the federal government.

The most useful bibliographies were compiled by the American Council on Education (1963a) and by Little (1963). The relative absence of research studies in these references indicates the need for research, regardless of methodology, in the complex and enormous field of relationships between government and higher education.

Additional Reference: American Council on Education (1964).

Federal, State, and Local Governmental Responsibility for Education

As indicated in Munger and Fenno (1962), federal involvement at the elementary and secondary levels of education generates much opposition within and without Congress. The excellent descriptive survey by Quattlebaum (1960) of federal educational activities indicates by the virtual absence of programs at elementary and secondary educational levels that indeed the federal government has left the responsibility for these levels to the states and municipalities. Babbidge and Rosenzweig (1962) explored the three main public issues implicit in congressional or executive educational policies: church-state relations, federal control of education, and segregation. The authors implied that the more general a federal program for education is, the more these three controversies will come into play. Even though Representative Edith Green (Reuther and Green, 1964), past chairman of the House Committee on Education and Labor, professed difficulty in separating the needs of colleges and universities from the needs of our lower schools, most of her lecture at the Harvard University Graduate School of Education was on higher education.

A state government's relationship to the institutions of higher education which it supports was explored by Brumbaugh (1961) in his summary, by institutional management areas of possible state control, of the 1959 Report of the Committee on Government and Higher Education. Morey (1961), a highly experienced public university administrator, brought his long experience to bear on the character of a state-supported university, its organization, and its relationship to a state legislature.

An exceedingly useful survey of the enacted and unenacted higher education legislation on the state level was reported annually on a calendar year basis by Martorana and Hollis (1962, 1963) and by Hollis, Martorana, and Brandt (1964). A review of the digests of the hundreds of bills in these descriptive surveys will indicate to the reader each state legislature's view of its responsibilities for higher education.

Goals of the Federal Government and of Higher Education

The literature pertained overwhelmingly to the federal government and higher education. Knight (1960), as editor and contributor of two of the five chapters, dealt in sweeping prose with the purposes of colleges and universities and the national goals of the federal government. He concluded that our institutions of higher learning are not only the wise servants of our society but its advisers as well and thus must be able to provide wise counsel. Knight did not come to conclusions but did suggest five planning areas for working national groups. He emphasized that there is a need for coordination at the federal level and within the diverse higher education sector of our society.

Babbidge and Rosenzweig (1962) found the same critical need for a coordinated effort by federal agencies to meet the needs of higher education. They questioned the federal system as a whole and whether it is well designed to meet higher education's needs for facilities, more and better trained faculty, expanded graduate instruction, and student financial aid. Further, they maintained that the dispersed nature of federal programs affecting higher education tended to fragment the institutions and their policy-making power. Babbidge and Rosenzweig supported this conclusion with an analysis of institutional decision making under the sponsored research grant and contract system, the matching-grant principle in health and graduate research facility programs, and the various graduate fellowship programs. They perceptively concluded that these uncoordinated federal programs shift the decision making for the allocation of university resources from central administrative authority to the individual investigator and that federal standards were applied frequently to the institutions. Four researchers—de Burlo (1960), Knight (1960, Chapter 3), Orlans (1962), and the Carnegie Foundation for the Advancement of Teaching (1963)—supported the above conclusion with details of administrative problems but did not concede that federal standards should always be accepted by the institutions receiving sponsored research money.

Because of the complexity of federal programs and the diversity of American higher education, none of the references stipulated specific goals for the government or for higher education. Representative Green (Reuther and Green, 1964) did state the general principle that higher education is a matter of public policy—but so did Jefferson in 1806. The Carnegie Foundation (1963) stated that many persons, in both education and government, held the opinion that the federal government's involvement with institutions of higher education must be concerned with whole institutions, not just specific parts thereof. Harrington (1963) took the same point of view in his trenchant opinions on the issues between higher education and the federal government.

To paraphrase Wilson (1963), an array of problems still face higher education in its relationship with the federal government. Of critical importance is the need to clarify the goals of education and to determine the best ways of achieving them.

Additional References: Hannah (1961); American Council on Education (1964).

Composition of Federal Interest and the Diversity of Higher Education

The first major research during this period was the Quattlebaum (1960) survey, an exhaustive compendium of federal historical background, of federal agencies with programs in higher education, and of the classification of such programs. This survey, prepared for the House Committee on Education and Labor, proved conclusively the opinion proffered in the other references that the federal government is investing enormous sums of money in a vast number of ventures concerned with higher education. In fact, this survey showed the luxuriant growth of federal funds for research. It is hoped that the Legislative Reference Service of the Library of Congress will update the Quattlebaum survey.

Little (1963) submitted a survey, based largely on 1959 data, of federal programs in higher education to the Commissioner of Education (then Sterling M. McMurrin), pursuant to Title X, Section 1001 (d) of the National Defense Education Act of 1958. The survey was in three parts: an account of the nature, scope, and number of federal programs in colleges and universities and the participating institutions; a report of the Orlans (1962) findings; and a series of observations, conclusions, and recommendations. The recommendations were limited solely to suggestions of quantitative studies the Office of Education should make and a recommendation that it strengthen itself to serve as a "center within the Federal Government through which over-all problems and policies in higher education may be considered" by all interested parties. In an earlier article Little (1961) gave a brief analysis of the two patterns of federal involvement and a breakdown of the 1,975 institutions of higher education by type and by source of control.

Both of these excellent descriptive surveys pointed up the real diversity in American higher education. It was little wonder that several of the references (Knight, 1960; Babbidge and Rosenzweig, 1962; American Council on Education, 1963a; and Wilson, 1963) called for more leadership by some higher educational group to present coherent, sensitive proposals for federal involvement.

Further, these surveys, plus those by Rivlin (1961), Orlans (1962), and the Carnegie Foundation for the Advancement of Teaching (1963), made clear that the issue of federal aid to education is not a simple, single problem or controversy but a conglomeration of issues and of vested interests in government and in higher education. This complexity has been the most serious impediment to passage of legislation.

Additional Reference: Patton (1962).

Legislative Process

Slight recognition seemed to come during the past five years that the congressional legislative process was worthy of study insofar as it had dealt with bills on higher education. Munger and Fenno (1962) and Babbidge and Rosenzweig (1962) examined the process from different points of view. Munger and Fenno, from the point of view of the political scientist, made a perceptive and thorough political action analysis with regard to higher education in the Congress, in its committees, and in the Executive Office. Babbidge and Rosenzweig's brief comments emphasized the importance of the appropriations committees and process from a point of view, as they entitled it, of "The Big Picture: Congress, Committees, and Commissions."

The pleas of the several years prior to 1963 for a coherent set of proposals from higher education for federal support were met by the American Council on Education's (1963b) statement of a "broad program of Federal action to help expand and improve American higher education." In order of priority, objectives were in the following areas: increasing physical facilities for instruction, research, and student housing; increasing faculty supply and quality of instruction and research; lowering financial barriers to higher education for qualified students; paying full costs of federally sponsored research; extending the urban renewal program; and six others. Amounts of money were specified in some cases, but there was little mention made of such considerations as organizational methods and eligibility criteria for meeting these objectives.

One wishes that Munger and Fenno would update their fascinating analysis to provide, with the same objectivity, the reasons for the defeat, despite Senator Morse's (1963) well balanced endorsement, of the Kennedy Higher Education Bill of 1962, or, to phrase it another way, the political accident rating. On the other hand, Babbidge and Rosenzweig's forecast of federal support for academic facilities, the first priority of the American Council on Education, came to fruition with the passage and signing by President Johnson of the Federal Higher Education Academic Facilities Act of 1963. In early 1965, HR 3220, four titles plus a definition title, was with the Committee on Education and Labor. Title IV of this bill is for student assistance in the form of federal scholarships flowing through the states by formulas and a federal guaranty program on student loans. The Academic Facilities Act also channeled the funds through the states on a formula basis.

Along with the congressional committees, Munger and Fenno (1962) underscored the importance of monitoring associations that represent interest groups within the diverse elements of higher education. As Quattlebaum's (1960) survey made clear by sheer numbers and as Babbidge and Rosenzweig (1962) reiterated, probably no other segment of American society has so many organizations and is yet so unorganized as higher education. However, two interest groups have had a decided impact on federal legislation, particularly in the past two years: the American Council on Education and the National Education Association. Munger and Fenno (1962) emphasized the role of the latter organization in the legislative process. Proponents of legislation need to maximize support by minimizing conflicts among supporters and to marshal their support at critical points in the legislative process. Munger and Fenno provided a delightful exposition of "strategies of substance" and "strategies of approach" in the fine art of practical politics involved in advancing a bill.

Additional References: McGrath (1962); Price (1962).

Topical Breakdown and Analysis of Past and Present Federal Government Support to Higher Education

The references were decidedly weighted toward federally sponsored research programs in colleges and universities, and all stated at some point that federal interest in higher education has been categorical, dealing with specific problem areas and not with higher education as a whole through general aid in the national interest.

Federal support of university research has been the most significant part of the government's relationships with American higher education institutions; in fact, research support means just that. With few exceptions, any broad educational benefits resulting from such support have been, in government eyes, by-products rather than primary objectives. The government agencies with the largest appropriations—defense, health, and science—have been largely confined by legislation to specific missions. Quattlebaum (1960), Knight (1960), de Burlo (1960), Orlans (1962), Little (1963), the Carnegie Foundation for the Advancement of Teaching (1963), and Reuther and Green (1964) all made this point, with quantitative detail given by Quattlebaum, Orlans, Little, and the Carnegie Foundation.

Although federal funds in enormous sums have been provided on a loan basis for student dormitories and other revenue-producing facilities as well as for health research facilities, as discussed carefully by Babbidge and Rosenzweig (1962), many millions of dollars have gone also into scientific research in the past 25 years, particularly since World War II, in an ever-increasing spiral. However, research funds tend to be distributed in large amounts to relatively few institutions. As detailed in the Carnegie (1963) study's 26 clinical analyses of higher education institutions and as supported by both the Orlans (1962) study of 36 institutions and one of the papers of the American Council (1963a), fewer than 500 of the 2,000 American colleges and universities received any federally sponsored research money in 1962, and 80 percent of all available funds went to only 50 institutions in that year. The total funds in 1962 came to $613 million.

Another reference for the magnitude and impact of federal funds on research in universities was the excellent review and position paper by the National Academy of Sciences (1964). The Committee on Science and

Public Policy of the National Academy stated its seemingly unalterable position in favor of research project grants and contracts as the backbone of federal support of basic science research in universities. It did not mention intra-institutional problems, as did de Burlo (1960), Orlans (1962), and the Carnegie Foundation (1963). While Babbidge and Rosenzweig (1962) were concerned about a dispersal of policy-making power within institutions having substantial sponsored-research programs (as were de Burlo and Orlans for the administrative problems created), the National Academy did not go into the subject, except to state (a) that the acceptance of a grant by the scientist commits him to a conscientious effort to achieve its stated purpose and (b) that he acquires no other rights to the granted or contracted funds. The Academy position paper also stated that the administrative officer of a university, upon accepting a grant or contract, causes the university to be legally responsible for the care and proper disbursement of the government funds. The paper said also that administrative officers should consider the relationship of research proposals to the development of the long-range interests of their universities.

Somewhat counter to this view were Chapter 3 in Knight (1960) and the previously cited works of Babbidge and Rosenzweig, Orlans, de Burlo, and the Carnegie Foundation, all of whom questioned the administrative officer's freedom of action to refuse a grant or contract.

Additional Reference: American Council on Education (1964).

Effects of Federally Sponsored Research in Higher Education

The intensive comparative clinical analyses by Orlans (1962) and the Carnegie Foundation (1963) are certainly landmark studies of the effects of massive federal expenditures for research in universities and colleges. Orlans concluded that the effects of federally sponsored research programs have been profound and beneficial in the sciences, noticeable but more imbalanced in the social sciences, and negligible in the humanities. The emphasis on graduate research and education had a deleterious effect on the status of undergraduate teaching and reduced personal contact between senior faculty and freshmen and sophomores, especially at large universities.

Orlans and the Carnegie Foundation agreed fully with the National Academy of Sciences (1964) that the project system of support is vital to the maintenance of high professional standards and the freedom of the individual investigator but that broader forms of support are desirable to strengthen (a) other institutions that offer the doctorate and are not in the top 50 recipients of present support as well as (b) neglected scientific and educational areas.

Additional Reference: American Council on Education (1964).

Future Relationship Between Institutions of Higher Education and the Federal Government

Certain trends have been discerned by Babbidge and Rosenzweig (1962). These were that programs that were narrowly conceived will become more general, that programs will broaden their institutional coverage of graduate fellowships, that federal programs will broaden vertically by widening the focus from graduate schools to embrace undergraduate education as well, and that the social sciences will get increasing support. Present signs indicate that these trends will continue to develop. It will probably also come to pass as broader financial commitments are made, such as an extension of the National Science Foundation or the National Institutes of Health general research grants, that the federal government will come very close to general aid to higher education. In this event, the issue of qualitative judgments on colleges and universities by federal agencies, even with the assistance of academic panels, will undoubtedly create controversy. Research is badly needed for various types of institutional evaluation.

The administrative staffs of both universities and federal agencies will need to be stronger and to have clear-cut operating policies. The devising of such policies will require facts and sound conclusions based on them.

Here, then, is an enormous opportunity for the researcher to study an interesting and critically important area of our society, one in which the research to date is miniscule. Research findings should contribute to the future national consensus and policy concerning what general aid the federal government will provide to higher education and to students. Surely, education will not remain much longer as the one major governmental function assigned primarily to state and local governments.

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- *Comprehensive and critical integrative summaries* of research in areas of reading. These are necessary to overcome the loss of historical perspective and useless duplications.
- *Theoretical speculations* about reading and reading research.
- *Notes on research in progress.* Short descriptions of important ongoing research projects when desirable.
- English summaries of reading research published in foreign languages.
- Reviews of new reading measures.
- Reviews of books on research in reading.

Editorial Organization. Dr. Theodore Clymer of the University of Minnesota has been named editor, and Dr. Edward Summers of Indiana University, associate editor. An editorial advisory board of about 25 specialists in reading and other areas is being selected from institutions throughout the world.

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